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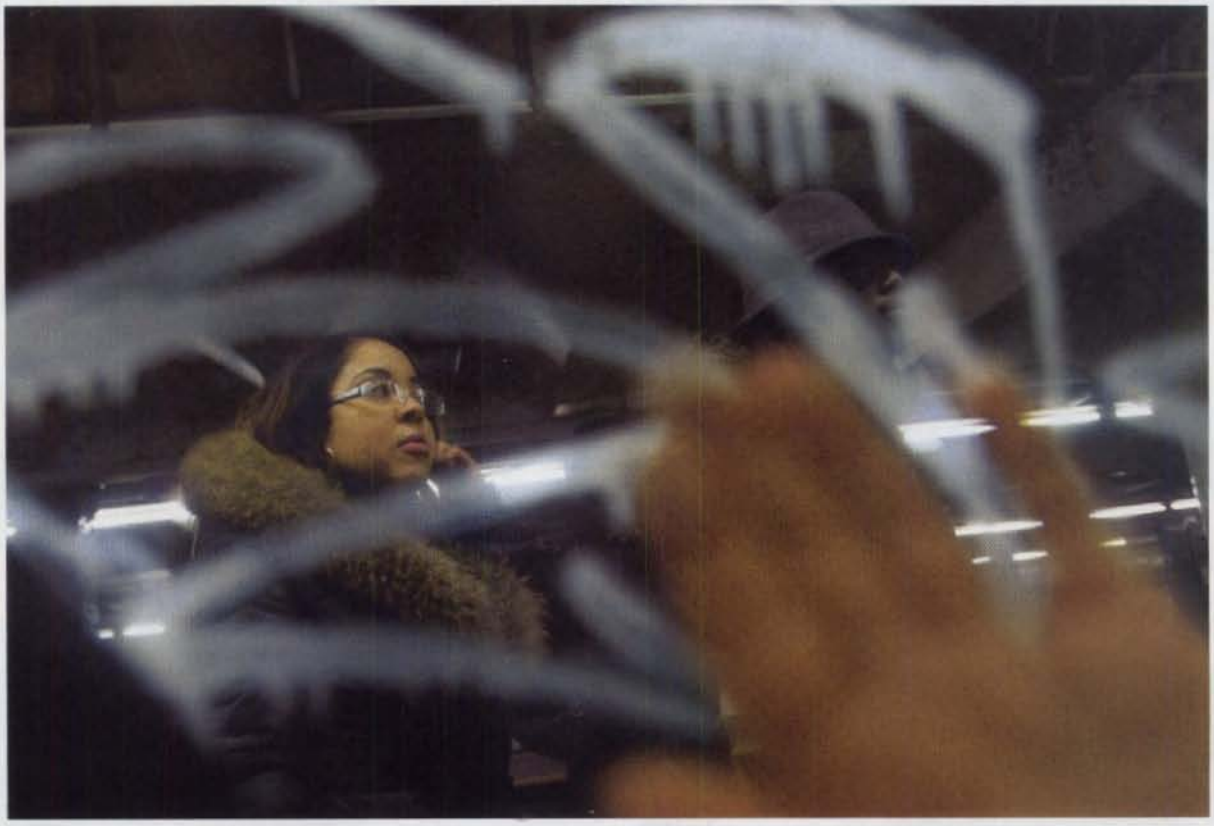

OUR WORLD

Lara Wechsler / Born in Miami in 1967 and moved to New York City in 1990. Her passion for photography was born the minute she laid eyes on the city and has been aflame ever since. She never leaves home without her camera. The city craves her creative work as well. At the age of 38, she began displaying her photographs, and at present her work fills a large number of galleries.

Photo data: SIGMA 18-50mm F2.8-4.5 DC OS HSM, 1/125 second exposure at F4.0

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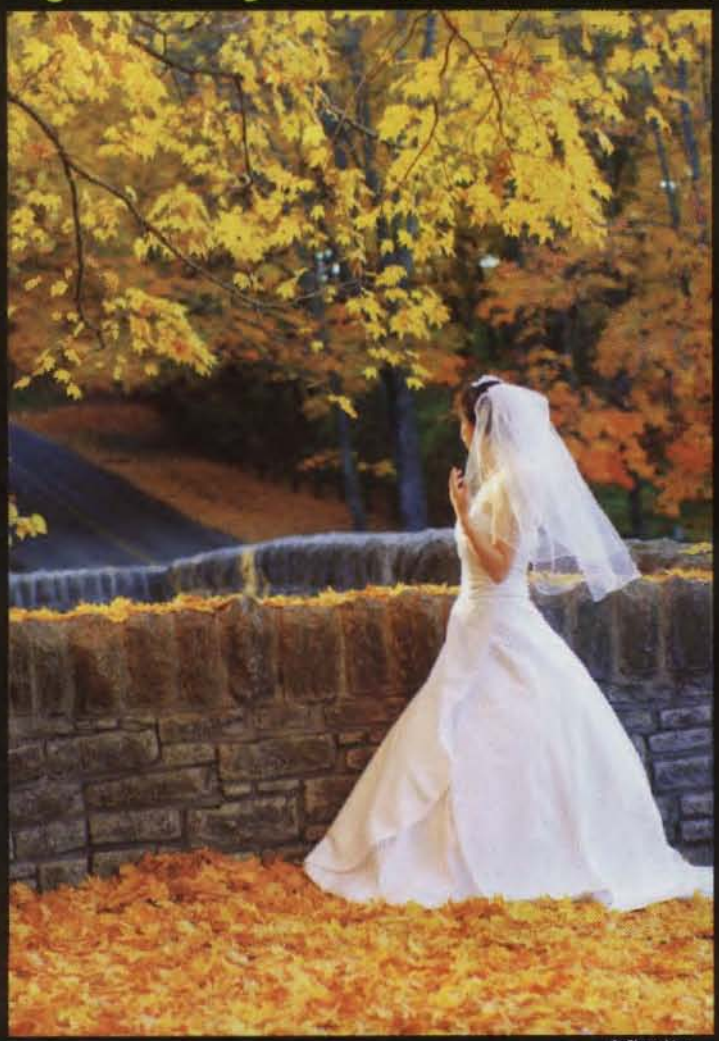

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▶NEW MASTER CLASS: LIGHTING

Pack your camera gear and join the Mentor Series as we trek to the birthplace of "life, liberty and the pursuit of happiness" this coming fall! Philadelphia will provide the perfect backdrop to learn the rewards of using light to create an intentional effect in your photos, as well as explore the history and culture this city has to offer. Follow Nikon professional photographers and illumination gurus David Tejada and Michael Clark as they simplify various techniques and help you address lighting scenarios that will convey a desired atmosphere, while capturing unique images in both controlled and spontaneous shooting situations.

▶**NEW** This trek includes a Master Class on Lighting, providing an exclusive opportunity to determine how luminosity can shape the mood and color of the photographs you create. Allow our mentors to assist you in finding the best angles, interpreting natural light sources, utilizing reflectors, and understanding how to control light. By learning how to properly use light modifiers such as umbrellas, soft boxes, snoots, grids, silks and even bounce techniques, you will walk away with a solid comprehension of how easily an image can be enhanced.

Visit the stunning Longwood Gardens, one of the world's premiere horticultural display gardens, as you gain experience directing hired models and practice using off-camera flash. Or reveal the beauty of the yellow, orange and purple trees, and the golden honey locusts, scarlet sweet gums, and ruby northern red oaks in the sunlight. Inside the Conservatory, have your camera handy as you discover a lush world of exotic flowers, with more then 20,000 blooming chrysanthemums, making for spectacular macro images.

Travel on to the infamous Eastern State Penitentiary, and explore what lighting is best suited to subject and scene, as we use America's most historic prison (open from 1829 to 1971) to shoot models and further practice learned techniques "on location". Take advantage of the penitentiary's vaulted, sky-lit cells to capture a particular mood in the jail that held some of America's most notorious criminals, including Al Capone. Later, photograph along a tour of Philadelphia's remarkable landmarks from the top of our own double-decker bus. Try your hand at making long exposure night images while you capture the Betsy Ross Bridge, the dramatic city skyline from Camden and visit the waterfront area of Penns Landing, and Boathouse Row.

Spend some time in Center City, exceptionally conveying Logan Square, or the famous Love sculpture by Robert Indiana. You will capture history with your camera at Independence Hall as you take in the birthplace of the Declaration of Independence, stop in Washington Square, and pay a visit to the Tomb of the Unknown Soldier.

Everywhere you go in Philadelphia, you'll find a piece of America's past, and continually discover the chance to utilize the lighting techniques you've learned to capture these historic landmarks. Explore "the city of brotherly love" with expert photographers by your side!

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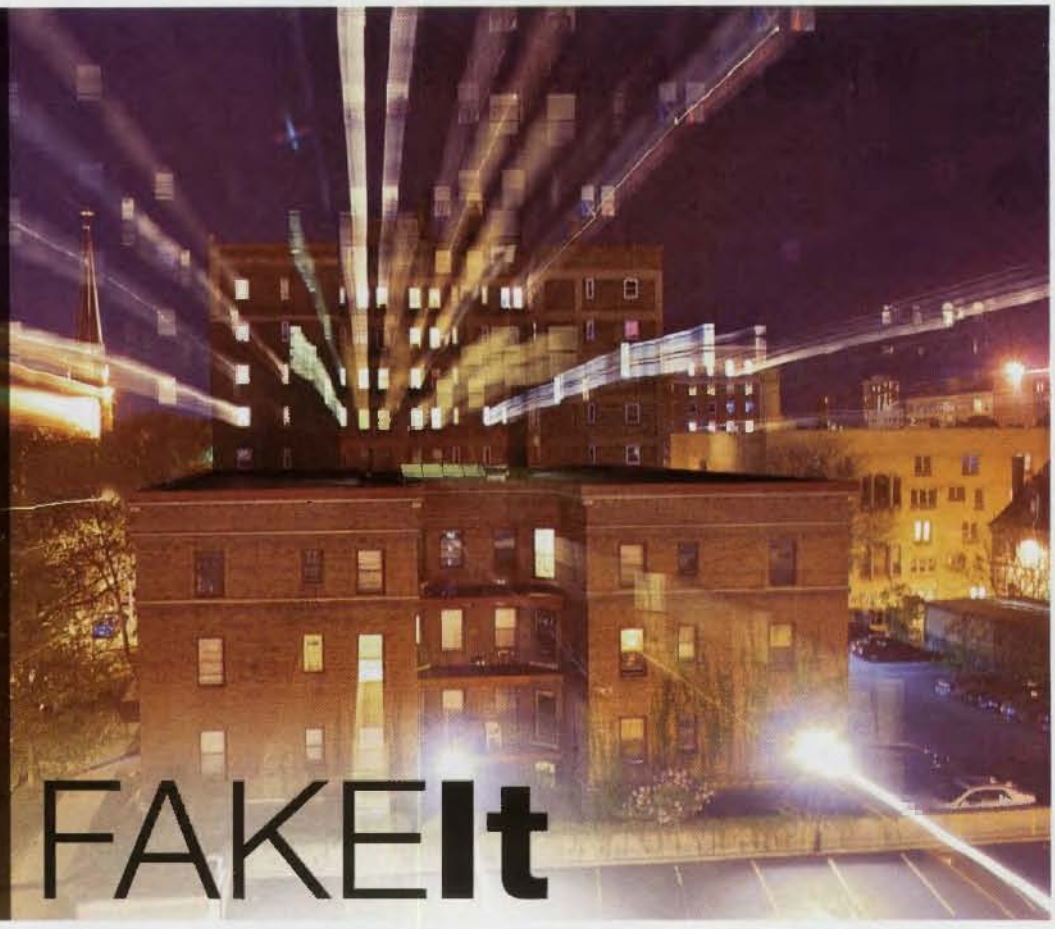

I really liked the how-to tips on faking motion (June 2009). The night I read the article, I went out to test out the technique. This is very exciting! Here's the image I got with my Nikon D60 and 18–55mm lens. I zoomed in while exposing for 30 sec at f/10 and ISO 200.
M. F. Hofstedt II
Milwaukee, WI

FAKE**It**

We ♥ Adobe?

I'm starting to think your magazine should be re-titled "Popular Photography and Adobe Products." Virtually every issue has references to Photoshop or Elements. I understand they're currently the industry standard, but so much can be done with less-expensive products. For example, I've been able to do most of the RAW file manipulation I would want to my Nikon D70's images using Nikon's free ViewNX, followed by free Picasa 3. I also find the reasonably priced Corel Paint Shop Pro Photo a powerful tool for digital manipulation.

I recently bought Photoshop Elements based on references in your articles, and soon realized it brought little additional capability to the table. You should make it clear that there are other products that produce similar results. And not everyone needs the power of Photoshop CS4. *Randy Fishwick*
Woodland Hills, CA

Yes, there are plenty of other programs, and many will serve you well at the enthusiast/hobby level. (Corel's Paint Shop Pro Photo X2 and Nikon Capture NX 2 are indeed especially good.) But if you intend to take image-editing as far you can—that is, make the most subtle and sophisticated changes—the full-fledged version of Photoshop is the way to go. And the best training ground for that? Elements. Which makes Adobe a lot like gravity—you can rail against it, but it's still a fact.

Kid stuff

What camera would you recommend for children? I have a son who soon will turn 3 years old. *Eric Fogle*
Moon Township, PA

Here's a trio of kiddie cams that are billed as for ages 3 and up. They're big and chunky, with rubberized grips, oversized buttons and *oops*-resistant construction. All have internal memory and low, toy-caliber resolution:
- Fisher-Price Kid-Tough Digital ($50, street) is waterproof for 30 minutes in up to 3 feet of water. It comes in blue or pink, stores up to 500 photos, and has an SD-card slot for more.
- Npower VGA 300K Pixel Digital Camera ($60, street) lets Little Ansel review the shots on a 1.4-inch LCD. The 8MB memory holds about 80 photos, and there's also an SD slot. Styled in Dora the Explorer or SpongeBob themes.
- VTech Kidizoom Camera ($60, street) comes with software so kids can create wacky pictures and effects when they plug the camera into a computer. In addition to holding up to 120 photos, it shoots up to 5 minutes of video. Also includes games such as Tic Tac Toe and a Memory matching game.

Really unreal

In your article on using greenscreen (Lighting, June 2009), the single most important thing for making composited images believeable was omitted: Foreground and background images should be shot at the same focal length, aperture, point of focus on the footage scale (use a stand-in when shooting a background), and, of course, with as similar lighting as possible. *Bob Wiemer*
Las Vegas, NV

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By John Owens

DealDETECTIVE

What do you really get for your money?

POP QUIZ: Say you're buying a Nikon D90 kit. Which lens is as high-tech as the camera, and which is a 10-year-old design? Answers: Left and right.

Pop Photo's editors have long raged against online camera deals that seem too good to be true. Our latest outburst was in April 2009, when a reader asked about a Nikon D3 with a load of accessories for just $3,475. Since we'd seen that camera for no less than $4,350, we declared the deal either a fantasy or a scam.

Soon after, several readers took us to task. Among them, Tessa Reeverts of DeKalb, IL, who reported landing on eBay a "brand-new Nikon D90 with a tripod, tabletop tripod, five Nikon lenses, 16GB memory card, flash, battery with charger, camera bag, USB card reader, UV filters, and free shipping for $1,344."

Holy cow! So I went to eBay and typed in "Nikon D90." Seconds later, I had Tessa's deal, as well as variations on it from a bunch of camera retailers I've never heard of. Each promised a brand-new, not refurbished, not gray-market D90, a pile of extras, and a panoply of lenses. For sheer volume of stuff, all of these eBay deals seemed amazing. But then I looked closely.

Consider the lenses. Tessa's kit did contain three Nikkors—an 18–55mm f/3.5–5.6, a 70–300mm f/4–5.6, and a 50mm f/1.8. But the wide-angle lens and telephoto weren't Nikkors at all, just those typically inexpensive converters that attach to the front of a regular lens. Fine for a point-and-shoot, but for a state-of-the-art DSLR?

And that's where I question even the Nikon lenses in this package. Despite the impressive range, none retails for more than $160. The only one I would buy is the 50mm, since the low-light capability of f/1.8 is hard to beat for $135. Not that the 18–55mm and 70–300mm are bad—they just aren't as up-to-date as the camera. (In fact, the 70–300mm is a 10-year-old design.)

Don't confuse them with the 18–55mm f/3.5–5.6G VR AF-S DX and 70–300mm f/4.5–5.6G VR IF-ED AF-S Nikkors. These are the latest shake-beating VR versions, giving you 2 to 3 stops of handholding leeway. (Tessa's lenses don't have VR.) Granted, they sell for $190 and $540, respectively, but in lenses as in life, you generally get what you pay for—especially with the more expensive 70–300mm and its internal-focusing system (so filters don't turn as you focus), Silent Wave Motor (quick and quiet), and chromatic-aberration-battling ED glass elements. None of which can be said about the $160 model.

But what if you want a D90 and don't want to spend more than Tessa did? How far does $1,344 go? I shopped at the websites of some retailers I *do* know—Adorama and B&H—and found what I think are better uses for $1,344: How about a D90 with a VR version of the 18–105mm and that 50mm f/1.8?

Better yet, the camera with a $439 shake-fighting Sigma 18–200mm f/3.5–6.3 OS DC lens. Or with another stabilized zoom, Tamron's 28–300mm f/3.5–6.3 XR VC LD. At $349, it leaves you with $95 to put toward an 18–55mm. And there are many other combos to suit your style of shooting.

Sorry, that doesn't give you the tabletop tripod (a bendy wire-legged 'pod that I doubt could support a D90), no-name memory card (if it's just standard speed, you might not get the most out of the D90's burst rate and video ability), or hot-shoe flash (hello, is there a brand name on that unit?).

But if you're buying a serious camera, you should buy higher-grade accessories. It's not snobbery, it's photography. The memory cards, filters, flashes, tripods, and especially lenses you use should complement your camera, helping bring out all of its picture-taking potential. You don't get that buying by the bushel.

I don't want to rain on any bargain-hunter's parade—but the smart money is putting up an umbrella.

▲Point of View $230–$300, estimated street ■ www.samsung.com

Clunky camcorders can wreak havoc on your wrists, so it's a good thing Samsung's new SMX-C10 and SMX-C14 are designed to be held more naturally and comfortably. The alien-eye looking "Active Angle Lens" design debuted on the HMX line—it includes an angled LCD screen that doesn't obstruct your view of your subject. **HOT:** Hyper Digital Image Stabilization, 10X optical zoom, time-lapse recording. The C14 model comes with 16GB of internal memory. **NOT:** Unlike the HMX line, these don't shoot HD.

◀Urban Exploration

$180, street ■ www.bogenimaging.com

Finding a camera bag that you'd want to carry even when you aren't toting your gear is like having your cake and eating it too. So you'll feel pretty smart carrying one of the bags in the National Geographic Walkabout collection. The NG W5070 backpack comes in black canvas with leather closures, and it has enough room for a day's worth of gear, as well as lots of personal items. **HOT:** Coated with a water-resistant layer, space for a tripod and 15-inch laptop (with a zippered removable sleeve). The lower padded compartment can fit a DSLR and three or four accessories; it can also be removed to convert to a regular daypack. **NOT:** Though it's great for the city, you'll want something more durable for nature treks.

Rattle and Roll ▶ $30, street

■ garyfonginc.com You probably don't lug a tripod when heading out with your point-and-shoot, but you'll often need one—which makes the smartly designed Gary Fong Flip Cage (part rugged camera-protecting roll-cage, and part sturdy tabletop support) an ideal accessory. It fits most compact cameras and comes in 10 colors. **HOT:** Folded, the metal frame protects your camera if you drop it, while still letting you take pictures. Flip the legs down and you can pivot it to shoot at different angles, including verticals and macros. **NOT:** While you still get away with carrying less, it might make your pocket camera not so pocket-sized.

OUR EDITORS' PICKS

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to bear cameras with the RS DR-1 Double Strap. The harness-style chest strap puts a DSLR on each hip for quick-draw shooting. ($130, direct; www.blackrapid.com)

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THE GOODS HIGH 5

1. Asus Eee PC 1008HA

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Asus pretty much started the netbook phenomenon with its Eee series. The latest, the 2.4-pound 1008HA, has a slim "Seashell" design just 1 inch thick. Specs are typical netbook: Intel Atom processor running Windows XP Home (or GNU Linux), 1GB RAM (enough for lower-horsepower image editors such as Adobe Photoshop Elements 7), 10.1-inch screen, and built-in webcam. Besides a 160GB hard drive, it comes with 10GB online storage—not a heck of a lot, but a nod to the future of cloud storage. Neat feature: a VGA Dongle to connect the Eee to a larger screen.

2. Dell Inspiron Mini 10

$384, direct (as configured) ■ www.dell.com

We chose this 2.6-pound model over the newer Mini 10v ($299, direct) because, for just $35 on top of the base price, you can configure its 10.1-inch screen with higher resolution (1366x768, not the usual 1024x576)—all the better for reviewing your images on the road. Blog obsessively, or just take a lot of notes? The keyboard is 92 percent of the size of a standard laptop's. Specs include the usual suspects: Intel Atom processor, Windows XP Home, 1GB RAM, webcam. And it's available in a riot of colors.

3. HP Mini 110 Mobile Internet

$454, direct (as configured) ■ www.hp.com

You can get an HP Mini 110 for as little as $275, street, but we'd opt for the 2.6-pound Mobile Internet model because that's exactly what you get: internet connectivity via the 3G cellular network. So you can go online anywhere you can get a cellphone signal—no hotspots or router needed. Great for uploading pictures while sitting under a tree, and a VGA port lets you hook up to a big screen when you get home. You have a choice of AT&T or Verizon networks, and a 2-year signup is required. Included in our build: Intel Atom processor, Windows XP Home, 1GB RAM, 10.1-inch screen, 160GB hard drive, webcam.

4. Lenovo IdeaPad S10-2

$439, direct (as configured) ■ www.lenovo.com

In a hurry? Check out this 2.2-pound Lenovo. Its QuickStart feature lets you view photos, listen to music, send instant messages, or make Skype calls without waiting for the operating system to boot up. The One Key Rescue System can also scan for viruses before the OS loads, which could be a lifesaver. For password protection without a password, you can log on via face recognition using the webcam. In our standard build: Intel Atom processor, Windows XP Home, 1GB RAM, 160GB hard drive, 10.1-in screen, and 6-cell Li-ion battery to go longer between charges.

5. Samsung N110

$410, street ■ www.samsung.com

This 2.8-pound Samsung offers a little more. The 6-cell Li-ion battery is rated for 8.5 hours of use between charges, one of the best in this category. The larger-than-normal touchpad, keyboard that's 93 percent the size of a standard laptop's, and tapered keys make digital input (that is, with your digits) easier. While some photographers might prefer a matte screen, the glossy 10.1-inch screen can provide better color saturation and higher brightness. Other specs match the norm: Intel Atom processor, Windows XP Home, 1GB RAM, 160GB hard drive, webcam.

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PICNICSpread

FUN IN THE SUN, SHOT FROM UP ABOVE

An alumnus of Harvard's architecture school, Alex S. MacLean never officially studied photography, nor did he ever actually practice architecture. Still, the use of space and land has been a consistent fascination for him in his photographic work. He's published seven books of his aerial photography, the most recent of which is *Over: The American Landscape at the Tipping Point* (Abrams, 2008). You can see more of his images at www.alexmaclean.com.

Q. Have you always shot from the air?

A. I didn't learn how to fly until graduate school, so up until then it was all ground photography, as I call it. Ninety-eight percent of my shooting, I'm flying solo. I just recently switched from a Cessna Skylane 182 to a Flight Design CT, which is a light plane with an enclosed cabin. It goes as fast as my old plane but can also fly a bit slower, and it doesn't have a strut under the wing. That means I can shoot with a wider-angle lens. I typically work from 17mm to 300mm, and before I could only shoot 24mm without capturing part of the plane.

Q. What are we looking at here?

A. These are picnickers listening to the symphony at Tanglewood in Massachusetts. It's incredible to see a

PHOTOS BY ALEX S. MACLEAN; INTERVIEW BY DEBBIE GROSSMAN

THE OUTTAKES: Upon consideration, MacLean likes this shot **(A)** almost as much as the one he picked with his editor (main image). But the other **(B)** is from too far away to be really intriguing.

scene like that against the green, as opposed to the usual sand on a beach. It was very striking and very colorful. Coming across all the picnickers on the lawn was a total surprise. I took a circle around and knocked off some shots. I didn't want to linger very long because I realized I was probably making some noise.

Q. Is it hard to fly and photograph at the same time?

A. The plane will fly itself straight and level, and the power is fixed so you don't have to worry about keeping your foot on the accelerator. Your feet are on the rudder so you can use them to control the yaw, and you take your hands off the control yoke for just a second to take the picture.

Q. How do you secure your camera?

A. It's funny, everyone pictures me hanging out the window. But you're in your seat there holding the camera up. Everything I do is handheld—I shoot through an open window.

Q. From inside, how do you look down?

A. If you want to shoot straight down, you have to put yourself into a sort of roll position. Of course, that puts you in an immediate turn, and you'll keep turning as you shoot. So if you want to set something up parallel to a road you have to anticipate your position.

Q. What camera? What lens?

A. It's interesting, because today you have all the metadata that would tell you all that information. But this was shot with my old Canon EOS 1 and Fujichrome Velvia 50 film. I would think most likely it was shot with a Canon 70–200mm f/2.8L lens. I try to shoot at 1/1000 sec or faster. I don't really like shooting wide open, so this was probably around f/4.

Q. What makes this the best of the set?

A. Some of it had to do with the sharpness of the photo. And also just because of the amount of picnickers—this one is shot from a little further back, so there are even more picnickers. It's just bigger. This was picked for a book in collaboration with my French editor, who is very good. Though I have to say, working on this story, I was revisiting that question: Why did I pick this one? A lot of my photography seems to ripen in the files. You come back from a shoot with preconceived ideas about what you were trying to accomplish and it really prejudices you. When they sit in the files for six months, you gain a little bit more perspective.

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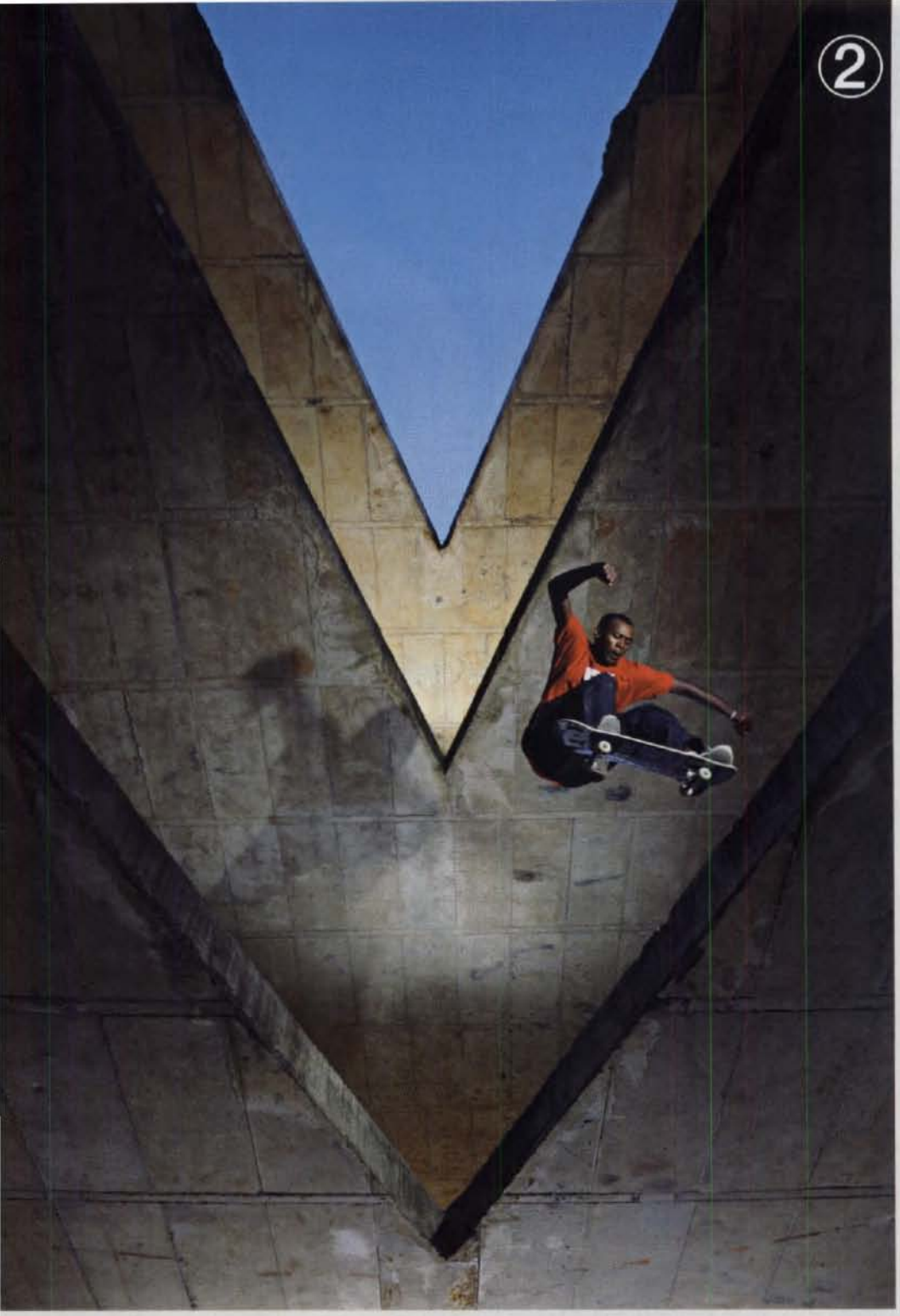
By Kathleen Davis



②nd Place

V for Victory

BEN BERGH, 38, runs a media agency in Johannesburg, South Africa, and frequently photographs skateboarders. Sam, the athlete in this graphic image, found an abandoned, unfinished office building to skate in, and Bergh positioned himself one story below Sam. They agreed not to use the shot unless Sam landed the trick correctly—after 60 attempts, they finally got this result, which pleased them both.

TECH INFO: Nikon D3 with 24–70mm f/2.8 Nikkor lens with four remote-triggered Sunpak flashes. Exposure, 1/250 sec at f/9, ISO 250. Sharpening in Nikon Capture NX.

①st Place

Foggy Idea

The old adage, "It's the journey, not the destination" held true for software company owner STEPHEN OACHS, 38. He captured this moody image on the Sacramento River during a trip to Oregon from his home in San Jose, CA. "The river level was low enough at that time of year to expose the 'tiles,' and the early-morning light illuminated the fog, giving the entire scene a surreal feeling," Oachs says. His photos have previously taken prizes in Your Best Shot in both 2007 and 2008. See more of his work at www.stephenoachs.com.

TECH INFO: Tripod-mounted Canon EOS-1D Mark III with 24–105mm f/4L Canon lens and 3-stop Singh-Ray graduated neutral-density filter. Exposure, 8 sec at f/22, ISO 100. Converted from RAW, with minor adjustment to white balance, exposure, and sharpness in Adobe Photoshop CS4.

POPULAR Photography

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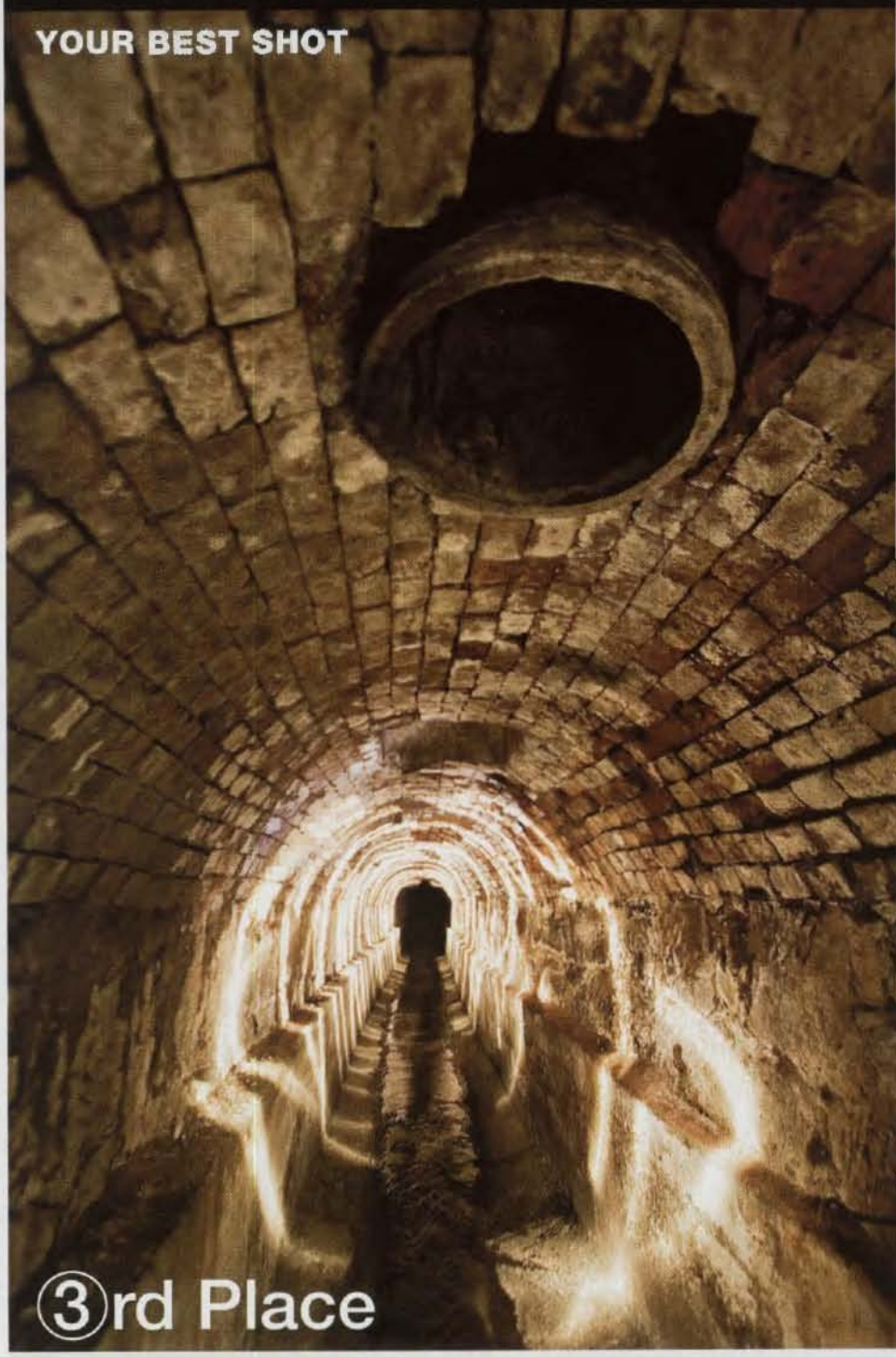

3rd Place

Light at the End?

Twenty-two-year-old ALEX WISE, a social studies student at the University of Tasmania, traveled his city's seedy underbelly to get this shot. This rivulet under Hobart, Tasmania, is cramped, wet, completely dark and known as a gathering place for "people doing things they shouldn't be doing," Wise says. He traveled with a friend to help him paint the tunnel with a flashlight for this otherworldly image. Check out more of his work at www.alexwisephotography.com. **TECH INFO:** Tripod-mounted Canon EOS Digital Rebel XT with 10–22mm f/3.5–4.5 Canon EF-S lens, with remote trigger. Exposure, 58 sec at f/3.5, ISO 100. Minor sharpening and Levels adjustment in Adobe Photoshop CS2.

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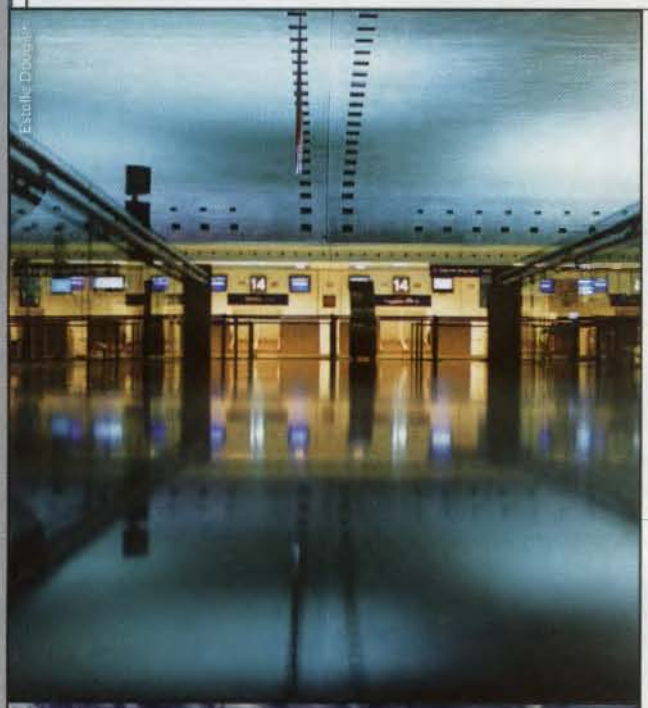

About

The 16th Annual *Popular Photography* Photo Contest gives photographers the opportunity to win prizes and have their work recognized in the January 2010 issue of *Popular Photography*, the largest photo magazine in the world, as well as on our website, **PopPhoto.com**.

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- ACTION/SPORTS
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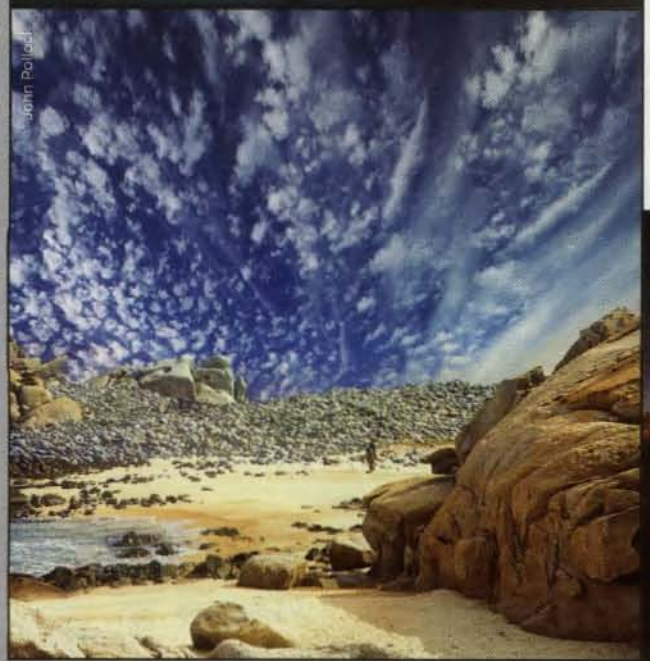

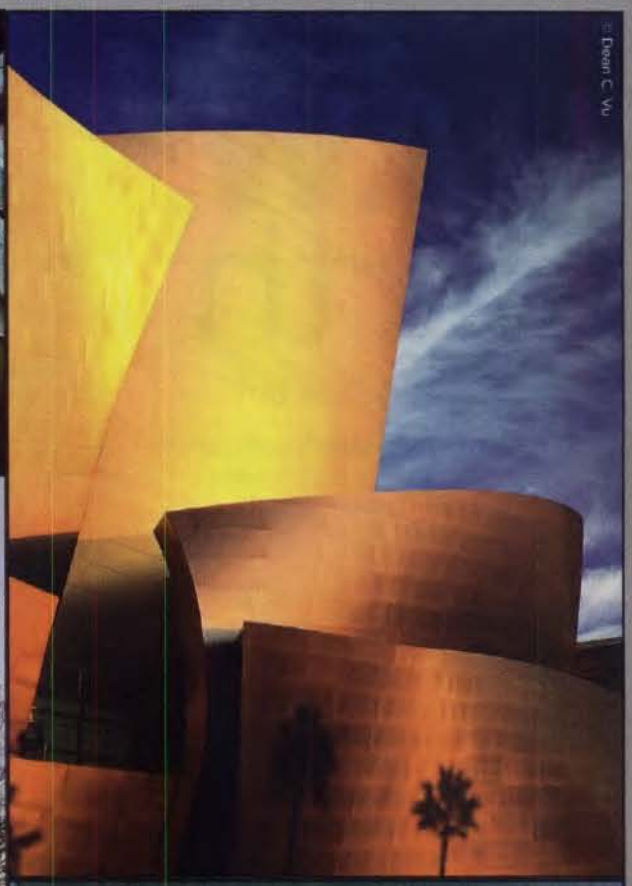

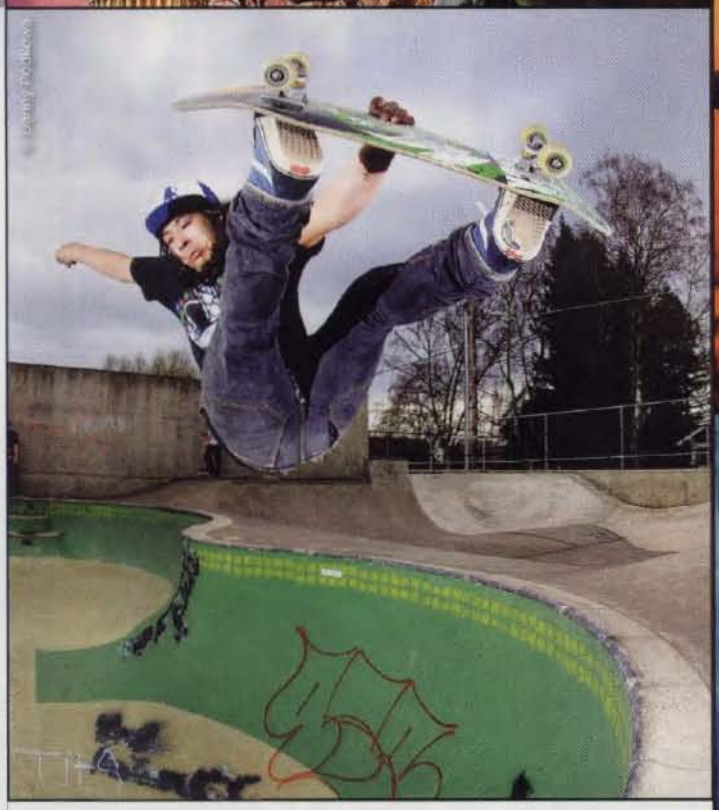

Submissions

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NATURE

Text and photos by Bob Hills

RAW Earth

Making art out of dirt

In the southwestern corner of the Salt Lake Valley lies the world's largest open-pit copper mine, the Kennecott Utah Copper Mine. At 2¾ miles across and ¾ of a mile deep, it truly is an amazing sight. And the area around it is nearly as fascinating.

I live about 20 miles from the mine, and in November 2005 I went to the area to see if I could find some old barns or sheds to photograph. In all of my shots I was careful to not include mine dumps—the piles of earth that came out of this gigantic hole. I'd always considered the mine an engineering wonder, but hardly an aesthetic one.

But that changed on a visit 14 months later, when I began to see the dump sites in a new way and did some visual exploring from a 400mm perspective. I was struck by the patterns of the eroded surfaces and by the enormous piles of earth that dwarfed the gigantic trucks carrying 320-ton loads.

I soon began to make a project out of interpreting the mining operations in an artistic way, using the elements of design that are a byproduct of creating the planet's richest hole. I wanted to show that this isn't an eyesore, but a magnificent work of art. So, for the next two years I made 40 trips to the site to photograph it under varied conditions. Here's how I did it.

Reach out

Though I usually enjoy shooting with my Linhof Technikardan 45s, I used a Canon EOS 5D for this project because of the wide choice of lenses, as well as the speed and flexibility of such a compact (relative to large-format film) system.

I started with a 70–200mm f/2.8L Canon IS lens and a Canon 2X extender. Unlike teleconverters of the past, this setup did not compromise clarity and sharpness. And the 400mm reach on my full-frame DSLR provided the

SNOW DUSTED: This photo was taken on Bob Hills' first serious trip to the Kennecott Mine, which inspired a full body of work. A 2X Canon extender on his 70–200mm f/2.8L Canon lens, mounted on a Canon EOS 5D, let him compose the image of snow dusting the waste dumps even from outside the site. Exposure, 1/640 sec at f/11, ISO 800.

DYNAMIC COMPOSITION: A Kennecott escort allowed Hills to enter this restricted site to photograph the colorful waste debris. He hadn't yet set up a tripod when he saw the tanker passing by, but he knew it would add interest to the image and immediately shot handheld. He used a Canon EOS 5D and 24–105mm f/4L IS Canon lens set to 105mm. Exposure, 1/320 sec at f/8, ISO 100.

COPPER PAYOUT ON HIGH: Again, a 2X extender and a tripod for his Canon EOS 5D and 70–200mm f/2.8L Canon lens rig allowed Hills to capture a truck releasing its 320-ton payload on the waste dump all the way from the edge of the town of Copperton. Exposure, 1/100 sec and f/36, ISO 200.

compressed perspective I wanted. For variety, though to a lesser extent, I also used my 24–105mm f/4L IS and my 17–35mm f/2.8L Canon lenses.

My tripod is a Manfrotto Model 3221, topped with a Manfrotto hydrostatic ballhead. The tripod is sturdy enough for my 4x5, but small enough to easily transport and hike with, using a sling strap. I love the hydrostatic ballhead since it is rated for 22 pounds, but is still smaller and lighter then other pro-grade ballheads. All up, the tripod/ballhead combo weighs less than 8 pounds.

An ordinary collapsible umbrella also was part of my shooting gear. In snow and rain, it not only protected the tripod-mounted camera, but also prevented snowflakes from getting too close to the lens and blurring out large areas of the images. I always handheld the umbrella to keep vibration and wind movement from being transferred to the camera.

Abstract thoughts

Creating abstractions became my favorite part of the project, as I came to see almost everything in terms of colors, contrast, shapes, lines, textures, and spatial relationships. The subject matter was secondary. Ledges, high

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MOUNTAIN-TOP VIEW: Scouting around a site helps you to find new shooting venues—such as this neighboring mountain view down on the pit. Shooting handheld allowed Hills to include the dynamic clouds from various positions. He used a Canon EOS 5D and 17–35mm f/2.8L Canon lens and exposed at 1/320 sec and f/10, at ISO 400.

walls, and the overlapping lines of the mine dumps, along with the ever-changing light, provided infinite opportunities. Eliminating the superfluous and concentrating on strong abstractions became my focus.

I did much of the shooting on overcast days. The RAW images were often flat and with little color, but in postproduction, on my Mac with Adobe Photoshop, I expanded the contrast to a normal range. By doing this, the color saturation would automatically reveal the colors inherent in the rock and soil. Sometimes I added a little saturation beyond what was released by the contrast bump. After all, my objective was not to be a documentary or scientific photographer, but to give a pleasing artistic interpretation.

Public access

While the images suggest long treks deep into the mine, that was hardly the case. In fact, my car generally was nearby, since for the first few months of the project I worked strictly from public roadsides. Eventually, I shot from the mine's visitors' center, which overlooks the hole. Never did I cross the fence-line surrounding the property. And when I showed my images to mining company executives, they found it hard to believe that I'd never violated the numerous "No Trespassing" signs. That just shows the power of a long tele to not only compress perspective, but, of course, to draw the subject much closer than the unassisted eye would see.

When I asked to shoot on Kennecott's land, permission took months to secure, and it clearly was one-of-a-kind access. After watching a safety film and buying my own hard hat and steel-toed shoes, I was escorted to the sites. Though the process was extremely involved, it was well worth it, as I ended up providing the images for the company's 2009 calendar.

Since my access really was a one-shot deal, you won't have any luck trying to replicate it. The good news is that, with Kennecott as with many other large-scale engineering projects, you can get great images from public roads, no permission required.

Looking closely

And just as I found inspiration in and around the mine, I also found a great deal of wildlife in the area. In fact, I'm impressed with how conscientious the owners and operators of the mine are about environmental issues and how much they've done to reclaim the land and protect wildlife.

One day alone, I saw seven large bull elk grazing in a meadow that had been reclaimed, and there are also large herds of mule deer, as well as mountain lions, foxes, and upland game birds.

In all, it has been a rewarding project that proves by keeping your eyes and mind open, you can find beauty where you'd never expected it.

Bob Hills is a fine-art and commercial photographer based in Sandy, UT. He has an Master of Fine Arts degree and 40 years experience. See more of his work at www.bobhills.com.

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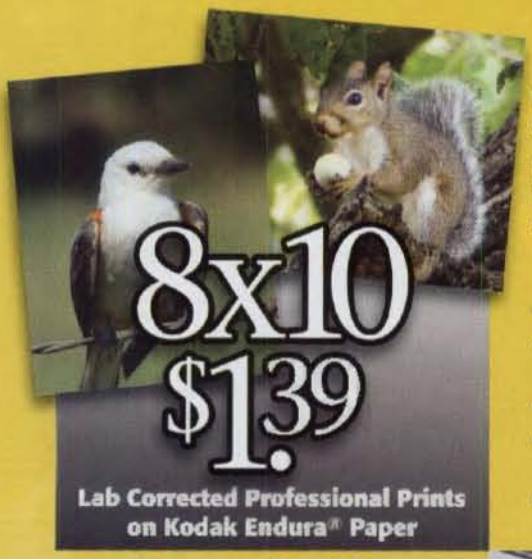

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Text by Peter Kolonia; photo by Mark Gong

SHINING Example

For the right tool to light jewelry, hit the disco

Glittering jewelry needs a bright, hard light to spark its brilliance, but when it's modeled on a person, bling also requires a subtle interplay of highlight and shadow to create shape, depth, and drama. The smaller the piece, the more precisely controlled this interplay must be.

Photographer Mark Gong was faced with just such a challenge when he illustrated a *New York Times* article about stackable rings. The lighting tool he selected probably wasn't one you've used—off the dance floor.

"Playing around and trying new things is always the most interesting and fun part of a shoot for me," says Gong. "For this one, I was inspired by the mirror balls you typically see in clubs. I was curious to discover what sort of lighting pattern I could create using their unique reflective properties."

Turns out, the mirror ball's intricate dappling of shadow and highlight proved perfect for this subject.

Gong wanted a controlled environment and precise lighting, so he shot in a small, dark studio, where it was relatively easy to reach out and adjust the position of the mirror ball or the model's hands.

The lighting he used here represented the third of four setups. "The scheme grew in an organic way as the shoot progressed," Gong says. "We started with a simple one-light setup, and just added and moved lights around until it looked right."

The shoot took more than five hours—especially grueling for the hand model, who spent extended periods seated on the floor with her hands held overhead.

For the setup here, Gong used three Profoto Acute D4 flash heads ($800 each, street), all placed behind his hand model.

For light modifiers, he needed the precision of striplights rather than the broad throw of square softboxes,

LORD OF THE RINGS: Mark Gong backlit his model's ringed fingers with a Profoto Acute2R 1200 pack **(A)** that powered two D4 heads in Profoto striplight softboxes **(B)**. He produced the halo-like effect on the background with a Profoto AcuteB 600R pack and D4 head **(C)**. So that he could move freely between the camera and model without tripping over a PC cord, Gong triggered the strobes with PocketWizard's Plus II wireless transceiver **(D)**.

so Gong mounted two of the D4s in narrow 1x4-foot Profoto Striplight Softboxes ($397, street). He placed them to the side, aiming them forward to rimlight the back of the model's hands and strike the mirror ball.

For an extra spark, he removed each striplight's front diffusion panel and inner baffle to expose the strips' foil-lined interiors. The result was a harder light with a metallic edginess.

The third D4, with grid, was set low behind the model and aimed toward the backdrop, where it produced a halo-like glow. The photographer juiced the strips with a single Profoto Acute2R 1200 power pack ($1,780, street) and the background light with a Profoto AcuteB 600R pack ($2,600, street). "I like the Profoto Acutes for their countless light modifiers, spot-on color temperature, and exposure consistency," he says.

As is common with pros, most of the equipment Gong used was borrowed or rented. Even his Nikon D700 with 105mm f/2 AF DC Nikkor lens was on loan from Nikon.

To fire the lights wirelessly, Gong used a shoe-mount PocketWizard Plus II transceiver ($160), which automatically triggered the power packs' built-in PocketWizard receivers. "I like moving to find new angles—sometimes on a tripod, sometimes not—and without PocketWizards, the PC cords can trip me up," he says. "I also get frustrated when the cord pops out of a camera's PC socket."

The hardest part of lighting his rings? "It was positioning the mirror ball and hands to correctly catch the light," he responds. "I took a series of images while moving the mirror ball back and forth to see which position illuminated the rings best. If I had to do it over again, I would use a larger mirror ball, or maybe a second one, with a fourth D4 dedicated just to it. It would save time and create more specks of light. I'd also use egg-crate baffles over the strip lights to cut down on spill and glare from the rimlights. The edges of the fingers show a little too much flare."

And, no, you won't find a mirror ball at your local camera store. "I found mine at a plastics store in downtown New York City," said Gong. "But you can also find them on Amazon and eBay. They range from $20 to $200, depending on size and material, and I paid about $30 for my 12-incher." ✪

To see more of Mark Gong's work, www.markmgong.com.

TIM BARKER, WWW.TIMBARKERSTUDIO.COM (ILLUSTRATION)

▼ORIGINAL

BACK TO BASICS

ELEMENTS EXPLAINED

Last month we showed you how to use Adobe Photoshop Elements to improve an image by cropping, fixing contrast, and improving color. Once you've taken those first steps, it's time to try some more sophisticated tools. This time, we'll fix an image that has sensor-dust spots, washed-out highlights, and, in some specific areas, too little contrast.

1 **FIXING THIS IMAGE** requires working with layers. The first is always called the Background Layer. Duplicate it so you can always go back to where you began. Go to Layer > Duplicate Layer, and click OK. If your image is 16-bit, convert it down to 8-bit to work with Layers in Elements.

2 **THERE WAS A DUST** spot on this sensor, and unfortunately it landed right on top of the little girl's lip. To get rid of this blip, zoom in. Type the J key to get the Spot Healing Brush. Tap the left bracket key ([) on your keyboard to shrink your brush circle, and the right bracket key (]) if you need to make it bigger. When your brush is the right size, click on the spot you want to remove and watch it disappear.

By Debbie Grossman

PART 2

ANGELA GEORGES (ORIGINAL)

3 **NOW TYPE CTRL + 0** to see your whole image fit on your screen. Since you want to retain the work you did on this layer but don't want to be wedded to your next fix, duplicate your Background Copy layer using the same method as in Step 1. Then go to Enhance > Adjust Lighting > Shadows/Highlights.

4 **SHADOW/HIGHLIGHT DEFAULTS** to a 25% lightening of the shadows. Override this by dialing the Shadow slider down to 0%, and move the Darken Highlights slider to the right until the blue of the sky deepens. Then adjust the shadows by moving the Shadows slider rightward until you get a hint of brightness. Beware: Moving both sliders too far creates ugly haloes around subjects. Click OK when you like what you see.

5 **MORE BRIGHTNESS** and contrast on the child's face will help draw attention. Start by making a Levels Adjustment Layer: Go to Layer > New Adjustment Layer > Levels, and click OK. Adjustment Layers affect all the layers below, and you can return to tweak them later. They are also the only way in Elements to use Masks, which allow you to fix just part of your image.

6 **IN THE LEVELS DIALOGUE,** move the black and white triangles until the girl's face looks brighter and a little more contrasty. Don't worry if the rest of the photo doesn't look so good—we'll get to that soon. Then click OK.

7 **THE WHITE RECTANGLE** in your Adjustment Layer is your Mask (circled). Elements selects it for you. Type D, then Ctrl + Backspace, filling it with black. Now type B to get the Brush tool, and paint with white on the girl's face. That will reveal the brightness and contrast changes you made in your Adjustment Layer. If you reveal too much, paint with black to cover it up.

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■THE PROBLEM
Everything's too sharp

Shallow depth of field and selective focus are great tools to direct the eye, but you can't always get those effects while you're shooting. Maybe there's too much light for a wide-open aperture, your lens is slow, or you don't have a specialty lens such as a tilt/shift or a Lensbaby. Or perhaps you only brought a point-and-shoot. Whatever the cause, you end up with a middling picture where everything is in focus, and the viewer has no clue what your real subject is.

To get the image you want, you could fuss with alpha channels and Gaussian blur in Adobe Photoshop. Or you could do it more easily with a plug-in. OnOne's FocalPoint ($135, street; www.ononesoftware.com) works with Photoshop and Elements, and makes getting selective blur simple. You can add blur that mimics the results of a selective-focus lens like the Lensbaby, or you can add a narrow band of focus to achieve a tilt/shift look.

Since FocalPoint is a plug-in, start by opening Photoshop. When you install FocalPoint, OnOne creates its own menu, and FocalPoint operates as a program-within-a-program.

Manipulate your image in FocalPoint, click Apply, and your changes will automatically be applied as a new layer, complete with mask, enabling you to easily tweak the work you've done.

■THE SOLUTION
OnOne FocalPoint

To determine how much and what exactly will remain sharp, FocalPoint utilizes something the company calls a "focus bug." Place the bug on your image, then manipulate its legs to select the area to keep crisp.

Choose a round bug for ellipses of sharpness or a square bug for planar lines of focus that intersect with the edges of the frame. You can also tilt the plane of focus to line it up with the camera's perspective.

Fine-tune your image with controls for the amount of smooth blur or motion blur, and add a vignette to more strongly direct the viewer's eye. Before you leave the plug-in's interface to return to Photoshop, add a bit of "film grain" to make sure the noise in the blur matches the noise in the sharp area. Doing so will heighten your picture's sense of realism.

—Debbie Grossman

NEW & NOTEWORTHY
- **Truly simple to use.**
- **Realistic effects can salvage otherwise boring images.**

CONSIDER THIS IF...
- **You like the look of selective focus, but would prefer to add it after the fact instead of sacrificing sharpness in your original.**

GARRY HORNBUCKLE/FOTOLIA.COM (ORIGINAL)

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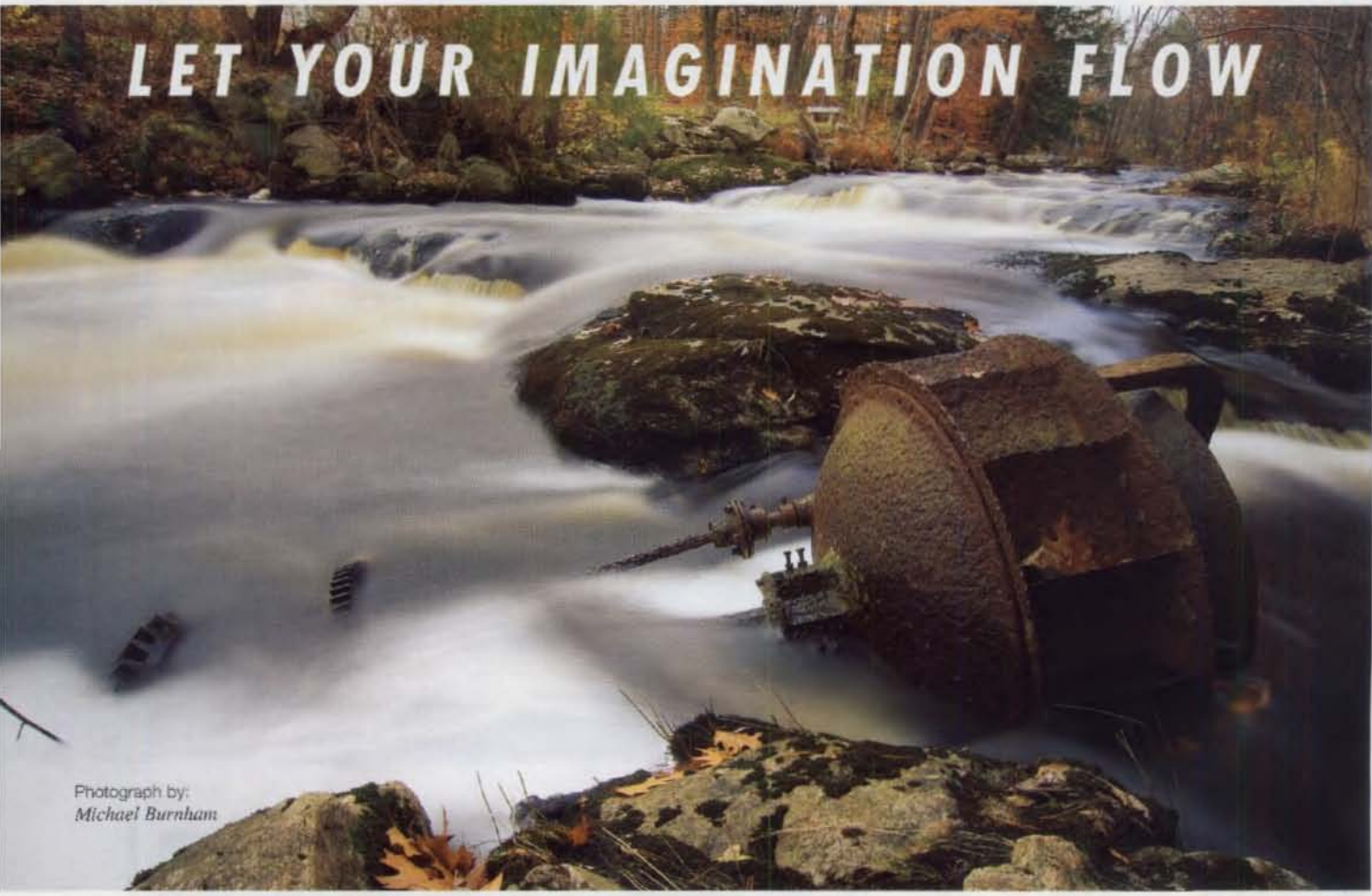

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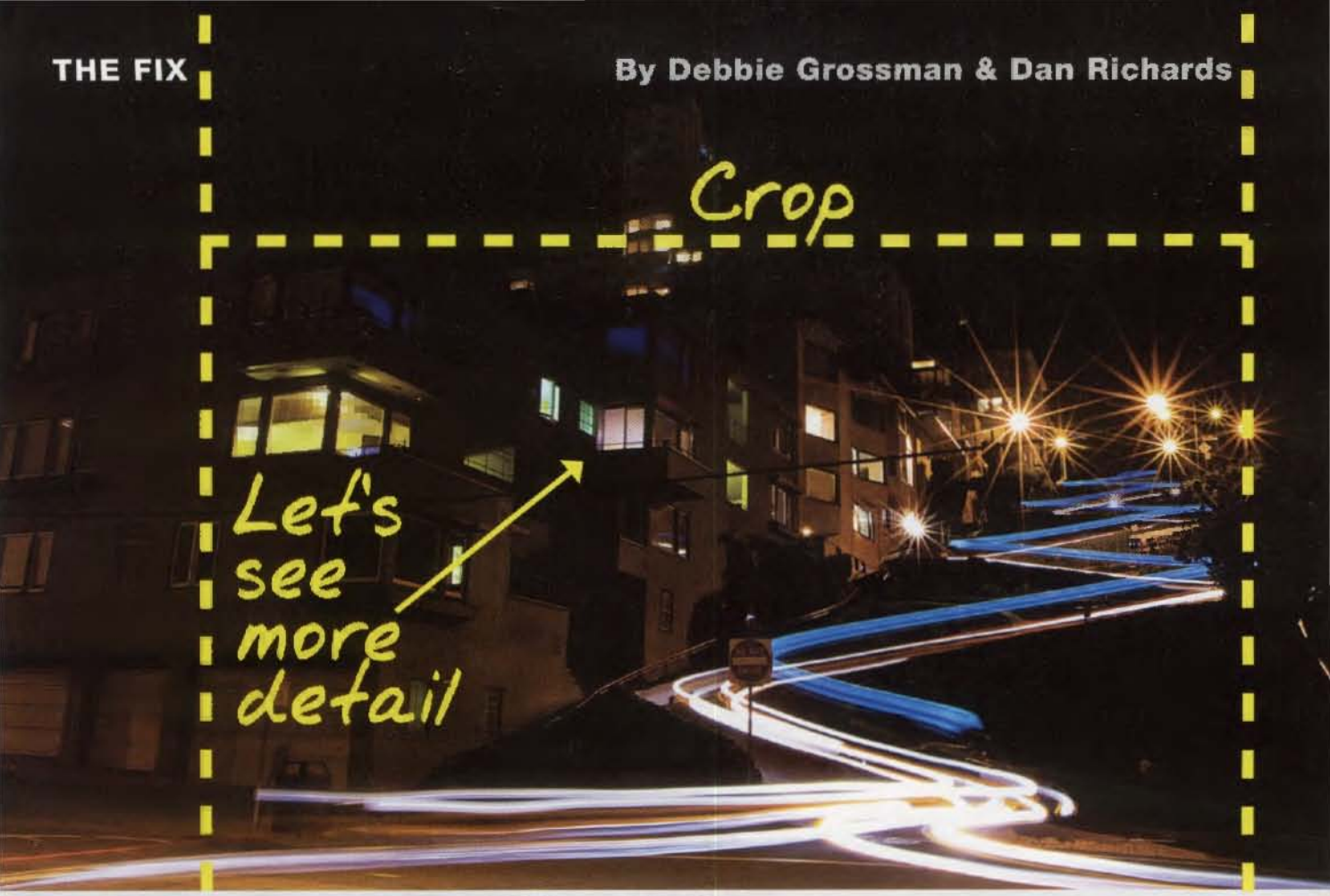
By Debbie Grossman & Dan Richards



ZIG-ZAG STREAKS

Mat Hayward
South Everett, WA

The problem: Just when we thought there was no new take on the squiggly portion of San Francisco's (otherwise very straight) Lombard Street, Mat Hayward sent us this clever time exposure, in which the streak of the lit sign on top of a taxi outlines the sinuous switchbacks. A small aperture produced the diffraction stars. We felt, however, that with some more detail in the buildings and the street, we'd gain a better sense of the place. We also thought that the areas of black sky at the top and at right of the frame were dead space. Nor did the composition need quite that much of the garage doors.

What now: There was plenty of shadow information, even in the JPEG, so we pulled up detail there using Curves in Adobe Photoshop CS4, but did our best to keep the highlights the same. We cropped everywhere except the bottom.

▲Before After▼

Next time: There's more in the picture than the streaking light, so dig out the buried treasure.

Tech info: Tripod-steadied Canon EOS-1D Mark III with 16–35mm f/2.8L II Canon EF lens. Shutter held open for the duration of taxi descent (87 sec) at f/22, ISO 100. Camera fired by PocketWizard remote trigger to avoid camera shake. Various adjustments made in Adobe Lightroom and Photoshop CS2. Check out Mat's website at www.mathawardphoto.com.

STRAIGHT STREAK

Jacob Tebbe
Toledo, OH

The problem: A very different take on streaming lights, this photo of car headlights on an otherwise empty road has an ominous quality—we think that it looks like a poster for a creepy movie. As with our other pick, though, there is considerable wasted space, particularly at the right of the frame, where nothing is happening. And the Fix Team had a bone to pick with the telephone poles and buildings, which bow inward due to perspective distortion. (Not that we're compulsive or anything.)

What now: We cropped in considerably from the right side, making the headlight streaks more dominant in the frame. We also cropped down from the top to maintain about the same aspect ratio, rather than creating a squarish shape. We were careful not to crop out any of the bottom, as we think the illuminated tar strips add to the visual interest. We darkened the sky a bit to add to the unsettling atmosphere. Finally, we used the Lens Correction filter in Photoshop CS4 to straighten out the telephone poles, which also corrected the shape of the buildings.

Next time: Beware dark space that adds no interest to the photo.

Tech info: Tripod-steadied Nikon D60 with 18–55mm f/3.5–5.6 DX Nikkor lens. Exposure, 30 sec at f/13, ISO 800. Color corrections in Adobe Photoshop Elements 6.

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Text by Laurence Chen; photo by David Ellis

HAT TRICK

Turning strangers into subjects

No matter the circumstances, Los Angeles-based lifestyle portrait shooter David Ellis (www.davidellisphoto.com) always begins with a question: "What's the mood we're trying to create?" It's all about authenticity and genuine expression. But how do you find that when you're photographing total strangers?

"These two guys are hard-core salesmen, earning their living on Venice Beach pulling people into their store," Ellis says. "I figured, they're bold in getting me to buy an expensive hat, so I'm gonna be bold with them." He told them that he wanted to get a shot of them with their hats. The guys were intrigued enough to stop selling and start posing, at least for a few minutes. That was all Ellis needed.

Here's how he made the connection:

1 Listen. People like to talk about themselves if you show that you're sincere about listening and not pushing your agenda. This way, you're more apt to get a unique expression of personality. "There's a very fine line between taking control and letting them be themselves—it's asking questions to get a sense of who they are, and it's knowing when to speak up and when to shut up," Ellis says. "If you give off a good vibe and can verbalize what you're interested in, people will lend a hand." And he always sends a print in exchange for their efforts.

2 Plan, but not too much. Before he even asked the hat salesmen to pose, Ellis chose the exact spot where he wanted them to stand, then led them there after they'd agreed. "Someone off-camera asked the younger guy a question, and he looked off to the side," Ellis says. "I liked the way it looked, so I told him to keep looking off-camera—and that was the shot."

3 Focus manually. Ellis' style is all about shallow depth of field. He always uses fast prime lenses such as a 50mm f/1.2L Canon on his Canon EOS-1Ds Mark III. "When you get a sharp picture at f/1.2, it's something to behold," he says. "It looks real, not like someone went in and retouched the hell out of it."

But the shallow DOF makes focusing tough, so Ellis manually adjusts his AF. His secret weapon: a Canon Angle Finder C ($180, street, with adapters). Designed for scientific purposes, angle finders magnify the focus point 2.5 times, enabling highly precise focusing with minimal DOF. But you must look down rather than directly at your subject. "It takes a lot of practice," he says, "but by using an angle finder I can look right at an eyeball and see that it's sharp. If you're shooting a photo with people in motion, you'll lose a lot [of frames], but less than if you just use autofocus."

4 Push through. At the start, these guys were having fun, and Ellis kept shooting. A lot. "I probably made 150 images in 5 minutes," he says. This gets people used to the camera and lets you get optimum focus. People often smile too much at first—but Ellis is interested in what they do after the novelty wears off.

"When they stop posing, you see what they're about. I work through this stage. I don't direct them—I see what they do," he says. "That tells me something about the person, and once you get past the initial awkwardness, then you can really concentrate on the mood of the picture and what is going on."

He feels the good stuff happens when everyone is a little uncomfortable. "I show them on the back of the camera what we're doing, and pretty soon everyone is working together to make the shot," he explains. "It says, 'We're in this together.'"

American Photo is now on Flickr®, and we're looking for some new work!

Six times a year, in each issue of *American Photo*, we will feature the work of one photographer (or up to three photographers) from our Flickr® community. This showcase will be a celebration of creativity and skill, not a critical analysis of the work. We will be photographic enthusiasts talking about photography we admire, and we will invite our readers and Flickr™ members to join the conversation. For these reasons, we decided not to call the feature the "Best of Flickr®" or "Superstars of Flickr®," but to focus on our common passion for creativity. **SHOW US WHAT YOU'VE GOT.**

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Text and photos by Art Brewer

AIRFlair

Kick out the blahs

My assignment? To capture Michael Jai White, a martial artist and Hollywood actor, in midflight for *Muscle & Fitness* magazine. This was back in 2006, and it wasn't exactly an easy shot to bag, but I bet most Pop Photo readers could pull it off with equipment they already own. Here's how:

1 **Find an athlete.** You need one who's accomplished and fit enough to strike a clean pose repeatedly. Besides the perfect form, an accomplished athlete will minimize the chance of someone—or some thing, like your lights—getting hurt. A skateboarder flying through the air, a soccer player mid-kick, or a football player leaping for a Hail Mary catch all work.

2 **Don't abuse your subject.** Have the shot well planned, with composition, lighting, and exposure determined in advance. My time with Michael Jai White was 20 minutes max, because my team had worked out the kinks before he arrived. Shooting much longer will tire your subject and compromise form.

TRANSFORMER: Art Brewer's original slide (here), taken with a Hasselblad H2 and 50–110mm f/3.5–4.5 HC lens on Fujichrome Provia 100 film, showed motion blur, due to the bright ambient lighting. After scanning, he sharpened the feet and eliminated the cluttered background (previous page).

3 Find a suitable location. Look for plenty of space, controllable background light, and body-friendly mats or crash pads to absorb the athlete's landings. For White, I had to use a gym near his home. It was fluorescently-lit with low ceilings that didn't allow high kicks or a backdrop. Not good!

4 Bring the right lights. To freeze an object in midair you need instantaneously firing strobes, with little or no ambient background light. Powerful shoe-mount flashes, such as Canon's 580EX II Speedlites, will work because they offer short flash durations and, with the right accessories, wireless triggering. Longer flash durations (i.e., 1/800 sec or longer) can record motion blur.

My basic lighting was two studio strobes, one coming from the left and slightly behind, with a reflector and grid. I powered it with a Profoto 2400 Pro 7A pack, and set its output about a stop brighter than the front light, which was to the right of White. The front light was a Profoto Acute2 Twin bi-tube head in a Profoto 72-inch Octobox, with the diffusion silk removed for a sharper, harder light. A bi-tube head lets you fire one light from two power packs (in this case two Profoto 2400's) for twice the light without lengthening flash duration. (Pretty cool.) Finally, on the right we set a 4x6-foot white California Sunbounce reflector for fill.

5 Watch your timing. It's everything, so practice with a stand-in to get it down. In this shoot, I took 24 frames, producing four or five keepers, with this one clearly the best—not a bad ratio.

6 Finesse it in postproduction. There was no way to avoid the gym behind White, so I removed it later in Adobe Photoshop. This not only cleaned up the background, but enhanced subject modeling, too. A win-win situation.

For more of Art Brewer's sports photography, visit www.artbrewer.com.

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①

FARTHER FIGURE

Text by John Owens; photos by Paul Kline

②

③

④

GOING TO THE ENDS OF THE EARTH TO HELP ORPHANS

Paul Kline doesn't want you to cry. He doesn't even want you to feel guilty and reach for your checkbook. He simply wants you to understand how many orphans there are.

"According to UNICEF, there are 150 million orphans in the world," he says. "That's equivalent to half the population of the U.S."

To get that message out, Kline and his wife, Mercedes, are in the midst of a project that has him photographing children in orphanages around the globe. It's called The Silent Children Project. "They are silent because orphans don't have parents to speak for them and represent their needs," he says.

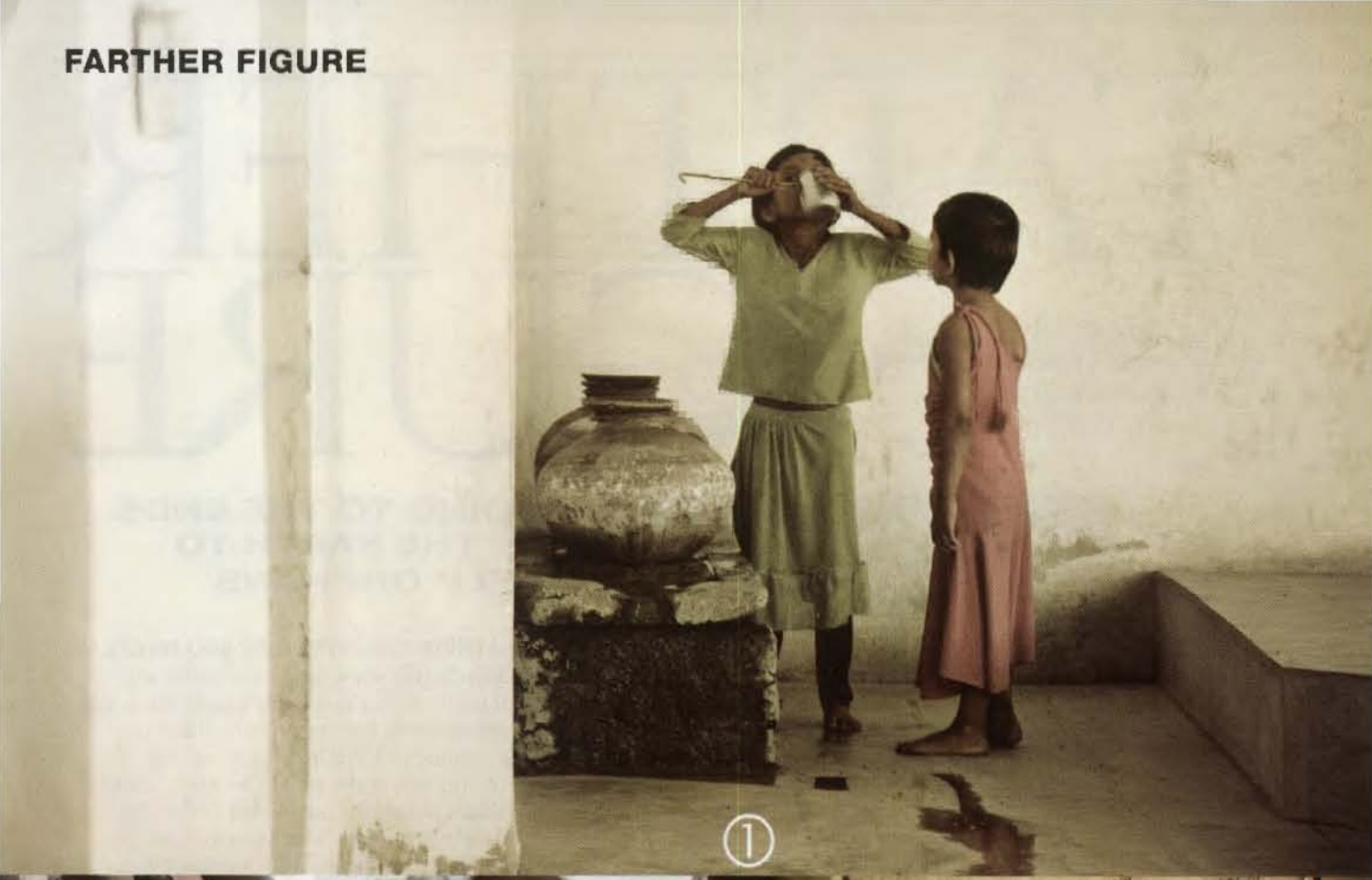
Long-time Pop Photo readers may recognize his name. Kline, 45, of Gaithersburg, MD, was one of three finalists in our 2006 Photographer of the Year Shoot-Out. This reality-show-style event had three talented photographers battling for a $5,000 prize and the title "The Best Shooter on the Planet." During a week in New York City, we gave them assignments ranging from shooting a goldfish to bagging a celebrity.

"One of my assignments was to photograph tourists," Kline recalls. "I've been a commercial and advertising photographer for a long time. To photograph strangers on the streets of New York...well, it took me out of my comfort zone."

But the photos were wonderful. "I really enjoyed it, and said, 'Hey, if I can do this in New York, I can do it anywhere!'"

AROUND THE WORLD: A South African orphan **(1)**, her face marked with traditional medicine, peeps out of the four-room house she shares with 39 other children. At a well-run orphanage in Mozambique **(2)**, the kids help with work. Dancers wait to perform **(3)** for the mayor of Uzhhorod, Ukraine, in a ceremony showcasing at-risk kids. A little girl from a Vietnamese orphanage **(4)** relaxes at home after school.

FARTHER FIGURE



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Around that time, Kline and his wife, parents of three teenagers, were looking for ways to give back. On a trip to see his mother in Israel (he was raised there), the couple visited orphanages in Israel and Palestine. By late 2006, the project was well underway. The goal: Photograph orphans in every part of the globe by September 2010.

When Kline spoke with us in early May, he and Mercedes had already traveled to Egypt, India, Mozambique, South Africa, Ukraine, and Vietnam—spending $50,000 of their own money doing it. They were leaving the next day for Brazil to meet up with fellow 2006 Photographer of the Year finalists and now close friends, Brazilian Roberto Soares-Gomes (winner of the event) and Canadian Henry Fernando. The month-long journey also would take them to orphanages in Brazil, Colombia, and Panama. "We're not trying to do a sob story," says Kline. "We're just trying to show what exists—both the good and the bad."

It's a range as wide as you can imagine. "There are some great orphanages and there are some terrible orphanages," says Kline. "What really defines them is not the amount of money they have. It's the adults taking care of them."

He cites two in Ukraine, mere miles apart. "In one, the director was extraordinary. The children were happy, clean, and goofing around," he says, a smile in his voice. "They have pets, TV, and they go on excursions. The other was dark, children had impetigo [a contagious skin infection], and it looked like an old Soviet institution. Everything is equal, except the management."

DAILY LIFE: At this orphanage in Rajasthan, India **(1)**, where the children go to a well to fill their water pots every day, "they are very poor and have basic food and shelter," says Paul Kline, "but the girls are happy and loved." A group of homeless orphans in Cairo **(2)** spend a week with a generous woman, her room lit by a single bare bulb; they move again each week. Palestinian girls **(3)** sit on the prayer rug in their dorm room in Egypt before their afternoon rest. In Mozambique, children grind grain for supper **(4)**: "I was looking for a good angle, when the little curious fellow looked at me," Kline says.

That's why Kline devotes much of his imagery to the caregivers: "These are the people who make it happen."

And wherever he goes, Kline has found that it's not just appearances that distinguish good from bad. "In the bad ones, the kids are clingy. They don't get a lot of affection. So when we arrive, they just won't let go."

When they first arrive, Kline often snaps away, with the kids posing and mugging for the camera. Mercedes, a nurse, offers whatever help she can. Both the children and adults have to get used to the Americans' presence.

Before long—they spend up to three days at each orphanage—"I'm almost like a fly on the wall," says Kline, "and I roam around watching for situations."

Though the mission is to shoot powerful, documentary images, he also takes scores of snapshots. "I learned to do that early on when the director of an orphanage in Palestine told me that orphans don't have childhood photos," he says. "So now I always send them prints, sometimes thousands of prints. Some directors tell me how the kids hang them over their beds or on their lockers."

The hardest part? Securing permission. In Kline's experience, good orphanages are very protective of the children's privacy, and bad ones of the adults running them. Either way, getting in is tough. "I'm rejected 10 times for every one I get into," he says. "You have to keep at it."

He starts long before leaving the U.S., contacting anyone remotely related to orphan projects in the place he'll be going. Traveling every six months, Kline spends nearly four months between each trip writing, calling, and e-mailing contacts.

Though he didn't intend to show the photos until the project was done, he found that permission was easier when authorities could see his work. With that in mind, he set up a website, www.silentchildren.org. It motivated people to contribute, and though Kline wasn't looking to raise money, just awareness, the contributions kept coming. So he set up a 501(c)(3) nonprofit to accept funds. "All of that money—100 percent of the donations—goes to orphanages and organizations that help street children," he says.

Late 2009 will take him to Scandinavia, and six months later, Australia. Late next year, with the shooting done, he hopes to publicize the cause with The Silent Children Project exhibits and a photo book.

Says Kline, "This truly was due to that assignment in the Photographer of the Year Shoot-Out."

IN THE BAG

"I need to travel light," says Paul Kline. For a photographer who makes his living in commercial and advertising work, "light" is relative. But there's no question that his camera bag is heavy in imaging power. Here's what he totes:

•CANON EOS 5D MARK II. He recently upgraded from the 5D and is impressed by the low-light performance of this new full-frame DSLR. When shooting indoors, being able to make the most of existing light is essential.

•CANON 28–300MM F/3.5–5.6L IS. "I use a Canon 24–70mm f/2.8L lens for my commercial work," he says, "but for this project I need more reach."

•CANON 50MM F/1.4. "It's an awesome lens," raves Kline, for both its low-light capability and the shallow depth of field afforded by that large aperture.

•CANON 17–40MM F/4L. With the full-frame camera, he gets true wide-angle coverage.

•LEICA D-LUX 4. "It's really good in low light for a compact."

Flash? "I use it rarely," he says, "mostly outdoors as fill flash." But with the recent acquisition of PocketWizard's MiniTT1 on-camera controller and FlexTT5 remote transceivers, Kline expects to do much more with his Canon hot-shoe flashes.

He packs it all in a Tamrac backpack, which he happily reports looks very little like a camera bag.

"A lot of the places I go are fairly dangerous," he says. "If people knew I had $7,000 worth of gear in my backpack, I'd be robbed."

THE FUTURE OF PHOTOGRAPHY

IMAGING TOMORROW WILL LOOK NOTHING LIKE IT DOES TODAY

BY NEAL MATTHEWS

SUNDAY, JULY 18, 2060.
Old-Timers' Day, Yankee Stadium.

You're here with your old photoglove, getting some action shots from your seat in the upper deck without even putting down the $40 beer in your left hand. What would look to us like normal sunglasses are in fact camera-equipped goggles with a heads-up display on the inside of the right lens.

Pointing the index finger of the photoglove, which is impregnated with tiny pyramid-shaped crystal microlenses surrounding nano-sized image sensors, you draw a frame around each bit of action so that a window appears to float in front of your goggles.

Blink: You bat your right eye to capture pictures of 86-year-old Derek Jeter throwing out the first pitch from deep center field, demonstrating his newly regenerated shoulder muscle.

Blink: A suicide squeeze.

Blink: A diving catch.

Applause is muted because the whole stadium is full of people pointing and winking at the field.

Back home, you begin to edit your pictures using a surround-vision display. The merging of the computer and the camera has brought computational photography to fruition, so it doesn't much matter that batters were distant and sometimes had their backs to you, because, using your glove, you captured a complete three-dimensional image of the players via thousands of tiny, wireless, GPS-enabled microcams that have been spread like glitter all over the field.

Though photos will still be composed by people with cameras, it will gradually become more accurate to say pictures were computed rather than 'taken' or 'captured.'

Choose an image from a 2D desktop display and it appears before you in 3D, lifesize, projected into an invisible fog from at least six laser projectors mounted in the walls. A joystick with a trigger and thumb buttons lets you change focal plane and depth of field, zoom in for close-ups, even alter the angle of view. Each picture is actually a few seconds of 3D video, since when you blinked the recording of that scene began five seconds before the blink and continued five seconds after. At 1,000 frames per second, each "capture" gives you the choice of separately viewing—and walking completely around—10,000 stills or replaying the action as if you were positioned on the field...

Based on current research directions, this is one possible photo future.

Where photography goes from here depends not just on what dedicated shooters want, but maybe more so on the whims of a billion app-happy cellphone junkies, each one of whom is already getting a much better camera every time they upgrade. The increasing miniaturization and simultaneous expansion of camera capabilities is now driving the outer edges of the photo frontier.

Where will it go? A number of possible tracks are discernible, but the widest vector leads toward increasing the camera's light-gathering function by several orders of magnitude.

"It's all about getting more information from the image sensor," explains Abbas El Gamal, an electrical engineering professor at Stanford University, whose research group has been developing ways to make CMOS sensors both smaller and more sensitive, capable of providing depth maps for super-3D image capture.

Though photographs in the near future will still be composed by

GETTING PERSONAL: Ramesh Raskar, associate professor at the MIT Media Lab and co-director of the Center for Future Storytelling, predicts that you'll be able to modify a photo's display according to your mood.

DALE MAY

THE FUTURE OF PHOTOGRAPHY

people holding cameras, it will gradually become more accurate to say pictures were computed rather than "taken" or "captured."

But this requires broadening the dynamic range of light and motion detectable by the sensor chip. "Without information," says El Gamal, "there is no hope."

Within this context, clues from current research in the realm of computational photography, combined with the predictions made by electrical engineers and technology visionaries, can be projected along a future timeline of what we can reach for—and maybe even grasp:

2015 INTO THE NEXT DIMENSION

There are 300 million cellphones in America, all of them containing increasingly sophisticated cameras. Pixels have gotten so small that 50MP point-and-shoots are common, and there are pro cameras in the gigapixel range.

High-def video is quickly evolving into 3D, jump-started in 2004 by the establishment of the global Network of Excellence in 3DTV, an eddy of manufacturers and researchers, including Holografika, Mitsubishi, Philips, Texas Instruments, and some two dozen others.

"You know how when you think of the past, you see it in black-and-white images?" says Nils Lassiter, an application engineer with Photron, a maker of ultra-high-speed video cameras. "In the future, thinking of the past will bring up 2D images, as if people were flat back then."

European Union-funded R&D on "autostereo" 3DTV—which doesn't require colored glasses to combine the two images required for traditional stereoscopy—has been focused on head-tracking, an extension of face-detection technology. Laser-based holographic projection, sending separate images from the display to each eye of the viewer (or multiple viewers), is just entering the market.

JUANJO TUGORES/FOTOLIA.COM

Still photos are following that lead toward autostereo 3D representation based on head-tracking that's built into the picture frame. Photographic prints on paper are competing with progressively thinner wireless 3D interactive display screens.

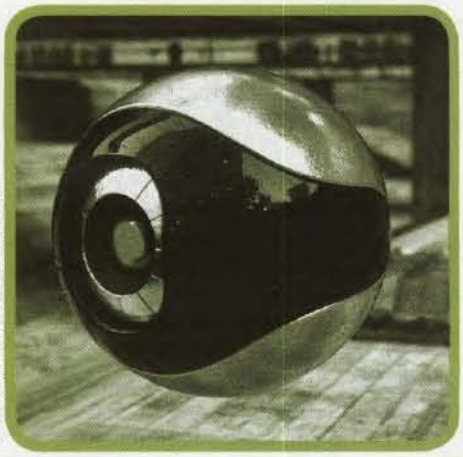
2020 RISE OF THE ORGANIC CAMERA

The trend toward using one iPhone-like device for multiple wireless tasks has almost peaked as the use of cameras declines, even though compacts are now the size of pocket change. (Pro cameras are about the size they were in 2009, but the multiplicity of lenses has been replaced by a single omni-lens.)

"At first, there will be one device for everything," explains Ramesh Raskar, associate professor at the MIT Media Lab who is co-director of the Center for Future Storytelling. "Later it will fragment all over the body, the camera to the eye, the phone and audio to the ear. Some people will have them implanted, some not."

Lenses have shrunk and moved closer to merging completely with image sensors, which are now mostly based on organic (carbon-based) compounds and nano-sized organic photo diodes. The sensor's flexibility allows it to be formed into spherical shapes, more closely resembling and functioning like the human retina.

"The spherical sensor gives you a very wide field of view, with everything in focus, similar to what the human eye sees," says Daniel Palanker, associate professor of ophthalmology at Stanford University. "Lenses will always be important because you cannot capture a picture without good focus. Today, we require expensive and bulky lens elements to correct for the curvature of the focal plane. But if you instead use a spherical sensor, you can capture sharp images with much less expensive optics."



BERTRAND BENOIT/FOTOLIA.COM

Breakthroughs in the power and miniaturization of solar cells have produced microbatteries that last for years without recharging. Deuterium, derived from seawater, has become the go-to isotope for power, but bio-batteries (which amplify the electrical charge emitted by bioengineered bacteria) and air batteries (based on the interaction of a lithium, zinc, or aluminum compound with oxygen molecules in the atmosphere) are on the horizon.

2030

IN THE EYE OF THE BEHOLDER

The fragmentation of wireless capabilities begins to take the camera and the phone out of people's hands, attaching or implanting the rice-grain-sized machines to their eyes and earlobes.

Competing for market share are light, wraparound sunglasses with 4D light-capture capabilities. This means a thin layer of image sensors can now record not just the color and intensity of the visible spectrum, but also the direction and angle of reflected light in the wider spectrum, including ultraviolet and infrared.

You frame a photograph by holding your extended forefingers and thumbs in front of you, like an artist composing the outlines of a painting. Tripping the "shutter"—now really just a "save" function—can be done with a verbal command, such as "Click."

Algorithms are computing a visual version of surround sound, allowing images to be viewed from perspectives other than where the camera was actually located. Photos are now almost identical to what the eye sees, but are also "relightable," which means making compromises to achieve high dynamic range is no longer an issue.

Depth of field is controllable, letting viewers, rather than photographers, see their own versions of the photo. "Photos can be displayed in a way that reflects your mood," says Ramesh Raskar of the MIT Media Lab.

Blurring of an image due to motion is both correctable and replayable as the "film-rooted distinction between 'still' cameras and 'video' cameras," disappears, as in a prediction in the STAR (State of the Art) research report on computational photography published in 2006 in the journal *Eurographics*.

Photography and holography have now merged, requiring something more than flat screen displays. FogScreen, an early-21st-century company whose patented "immaterial" display is a free-floating screen of dry fog you can walk through, has seen its technology evolve into 6D panoramic displays filling whole rooms in which the viewer can walk around freely among projected images. These "immersive" displays have further blurred the line between real and virtual existence.

ROBERT FORI/FOTOLIA.COM

2040-2050

IMAGES WITH A WAVE OF A WAND

The camera as a device you carry has completely disappeared. Image sensors have become part of the literal fabric of everyday life, woven into gloves and photo cloth, which produce 3D images after you rub them over an object such as a human face.

We now have "camera wallpaper" and live Google Earth, which records continuously and allows the viewer to remotely select and experience virtually any public scene in the world. Displays have become tiny laser projectors beaming images directly onto your retina.

Matt Hirsch, a graduate student in the field of information ecology at MIT, foresees "painting" a photograph by waving "a tiny wand containing an infrared laser and terabytes of data storage," he says.

"Cameras in the environment will work collectively to image the scene from your perspective, and from other perspectives of interest, and then transfer the resulting data to your wand. You could then dial back from this point to see the scene at other times in the past."

Image sensors encased in microlenses and connected to GPS receivers are now sprinkled like confetti almost everywhere. The concept of privacy is in flux and widely disputed.

Researchers are getting close to being able to tap directly into the neural pathways of vision in your eyes and brain, accessed by an external probe held gently against the temple, like those used today for ultrasound imaging. Everything you see is now downloadable.

The concept of the camera as an actual object is *so* 2009.

WWW.IMAGESOURCE.COM

THE FUTURE THAT BOMBED

THE NEXT BIG THINGS—THAT WEREN'T

BY DAN RICHARDS

OVER THE YEARS POP PHOTO has been pretty good at predicting future photo technology. "Pretty good," though, does not mean "flawless." And the photo industry has launched some, um, breakthrough products that should have stayed on the drawing board. Just take a look...

FUTURE INTERROGATIVE DEPT.

- February 1958: "Will [Video] Tape Replace Film?"
- April 1958: "Are Subminiatures a Threat to 35mm Supremacy?"
- October 1958: "Will the Russians Beat Us to a Fully Automated Camera?"
- Sept. 1972: "Is 35mm Dead?"
- June 1975: "Can Photography Help Your Child Develop a Superbrain?"
- December 1978: "Serious 110 photography—bowing in or bowing out?"

PAST IMPERFECT DEPT.

In 1966, the Fotochrome camera was touted as "bypassing the expense of color film and its processing" by imaging directly onto photo paper. That is, a roll of paper in the bottom of the camera, big enough to make 10 2x3-inch prints. The pictures didn't come out finished—you still had to have the prints developed. And lotsa luck: It used a proprietary paper that pretty much only the Fotochrome company could process. And you had no negative to make enlargements from. In other words, all the disadvantages of Polaroid with none of the advantages. But the Fotochrome made up for this by being hopelessly unreliable.

REALLY BIG BUST DEPT.

- POLAVISION

Born: 1977. **Died:** 1979. **We said:** "It may well turn out to be the beginning of an entirely new medium." **Why it fizzled:** It was the heyday of Polaroid, so when the company launched a self-developing home movie system, there was no reason it wouldn't be the Next Big Thing. Except that it was massively, irredeemably lousy.

- DISC FILM AND CAMERAS

Born: 1982. **Died:** 1999, after being moribund for years. **We said:** "Aids...[taking] good pictures in almost any kind of lighting situation." **Why it fizzled:** Kodak had been highly successful with a string of amateur film formats: 127, 126 Instamatic, 110 Pocket Instamatic. So why not Disc film? One fatal flaw: The negatives, at 8x11mm, were just too small. Prints were grainy. Blowups? Forget it! But the cameras were cool little things, and they helped give consumers a taste for ultraslim design.

- ADVANCED PHOTO SYSTEM

Born: 1996. **Died:** APS film is still alive (Fujifilm makes it, but Kodak stopped in 2004). **We said:** "The pint-sized APS frame...dramatically surpassed 35mm in sharpness and granularity." **Why it fizzled:** If you spend five years painstakingly developing something, you end up with a cutting-edge product—for five years ago. One rationale for APS was market research showing that consumers wanted easier-to-load cameras. But by 1996, virtually every 35mm compact (above the most basic) had auto film loading and rewind. It didn't help that APS loading was less reliable than 35mm, nor that consumers never really took to its three print formats. And then that digital fad came along.

- 3D PHOTOGRAPHY

Born: Seemingly every year since the invention of photography. We've had stereoscopes, lenticulars, anaglyphic glasses, polarizing glasses, wiggle stereo, digital 3D mode, the Stereo Realist, the Nimslo, the Loreo... **Died:** Never. Photography's version of The Undead. **We said:** See for yourself on page 54. Then check back with us in 30 years.

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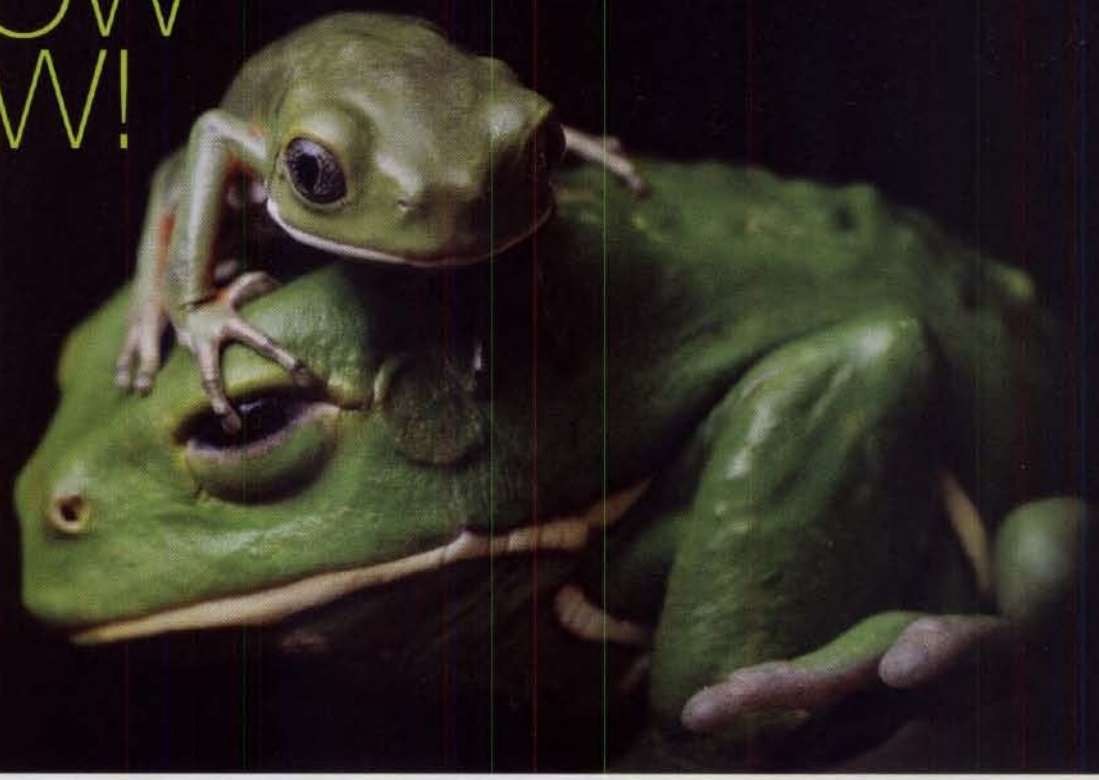

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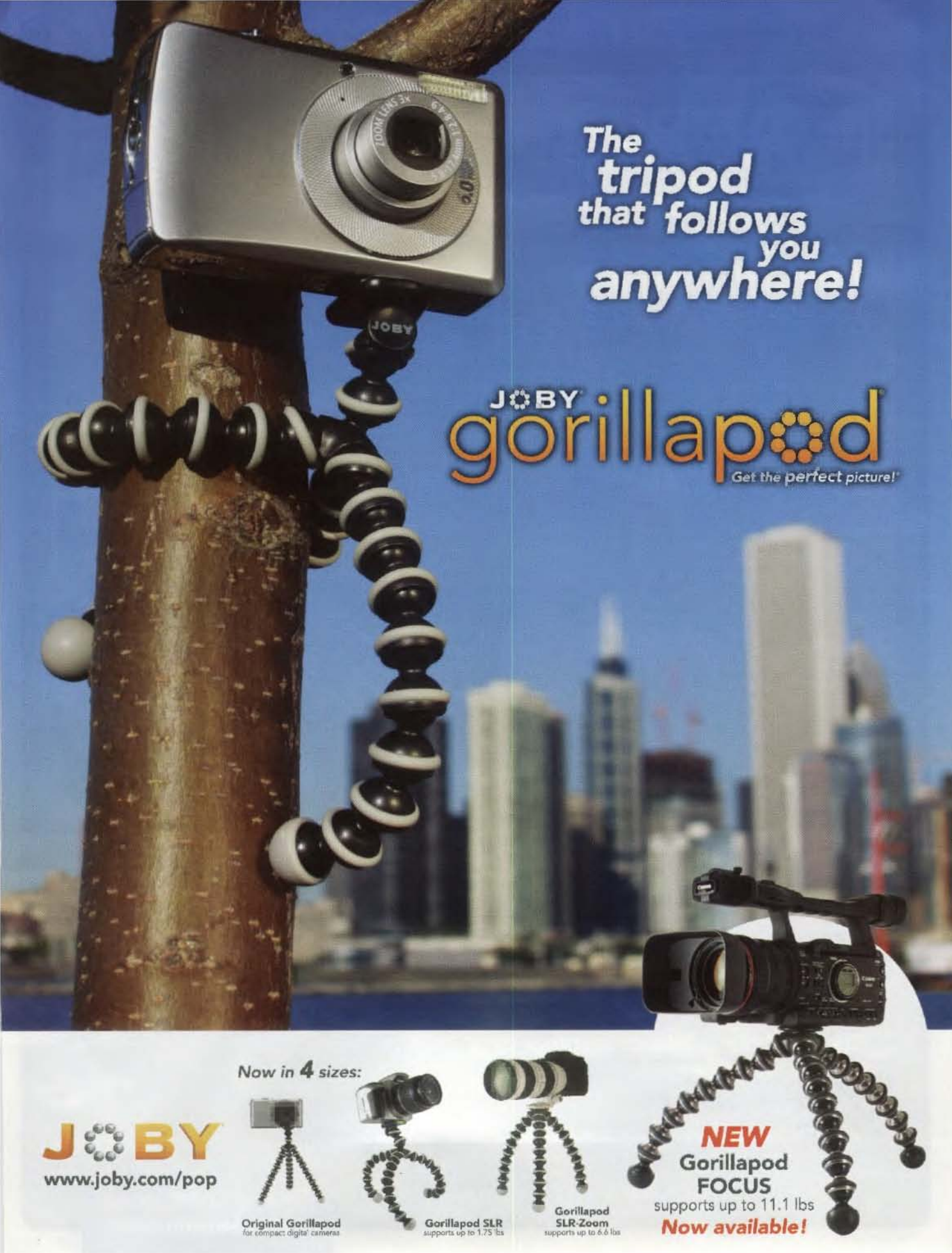
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YOUR FUTURE LIFE ...NOW

HIGH-TECH IS EASIER, AND CHEAPER, THAN YOU THINK
BY DEBBIE GROSSMAN

IMAGINE A DAY WHEN

everything we shoot will be automatically backed up and offloaded without our help, when all our images will automatically contain all the metadata we need to identify them, and we will have access to all our photos, all the time, from anywhere. Think it's far off? You're wrong. That day is here, and it's cheaper and easier to set up than you ever would have imagined.

I wanted to know what it was like to live as much in the future as possible. So I rounded up some gear, all of it readily available and not one item costing more than $300. Then I tried it out.

The biggest surprise? How different it felt. Without the need to label, keyword, and—most important—offload and upload, I found myself freer than ever simply to shoot. My Eye-Fi card and my Buffalo LinkStation Pro, especially, quickly became indispensable. Now I can't imagine my life as a photographer without them.

Here's what I used, how I used it, and some extra ideas for living in the future—right now.

IMMEDIATE SHARING

When the original Eye-Fi card came out a few years back, there was plenty to get excited about: I loved the concept of automatically uploading my images to a photo-sharing site such as Flickr, but I didn't see what the big deal was about having them autodumped to my computer. I shoot primarily in RAW, and those original cards could only upload JPEGs. And I also didn't like that the card couldn't discriminate—everything you shot would be uploaded. When I goof up, I don't want the world viewing and critiquing my outtakes.

The recent introduction of the Eye-Fi Pro ($150, list) changed my mind. The number-one reason: It can now record and transfer RAW images. And, almost as important, I can control exactly which photos are uploaded.

Before you use the card, you plug it into your computer using the proprietary USB card reader that comes with it. Configure it as you wish—choose your Wi-Fi network and enter your password, and pick which online service and folder on your home computer you'll upload to. The whole setup is ridiculously simple, and would be even for someone who's not a software expert.

Then start shooting. If your computer and your camera are on, uploading happens simultaneously. There are many ways to configure the card, and it will upload to most of the major sharing sites.

I have a Flickr Pro account, and since the Eye-Fi Pro will upload both photos and video, I picked that as my upload destination. The Eye-Fi sent the JPEGs there (Flickr doesn't accept RAW), and I chose a folder on my Buffalo LinkStation Pro desktop hard drive (more

MEMORY CONNECTION: Eye-Fi's pro card lets you automatically upload, share, and geotag your photos right from your camera. It works with RAW files, and you can control which pics to share.

YOUR FUTURE LIFE ...NOW

on that later) to accept the RAW files and JPEGs. I'd love it if I could send all my RAWs to my home drive and upload only selected JPEGs to Flickr, but the current version of the Eye-Fi can't follow different rules for RAW and JPEG. So, I ended up sending all the JPEGs to Flickr, but keeping my account settings on private—I did a batch edit later to make the best ones public.

The Eye-Fi card can connect to any Wayport Wi-Fi (now AT&T Wi-Fi services) hotspot, so if you're on vacation, your photos can be uploaded automatically before you even get home. And if you leave your computer on, or have your housesitter turn it on every couple of days while you're on vacation, your pictures will be automatically dropped to your hard drive from Eye-Fi's servers. When you're within reach of most U.S. Wi-Fi networks, you can turn on geotagging and the card will figure out your location and add it to your photos' metadata.

I never would have thought that removing the need to connect my card to my computer would streamline my process so much. But my friends and family have seen more photos sooner than they ever have in the past, because sharing them is just that much simpler. And I can rest easy in my travels knowing that all my favorites are backed up before I even reach home.

ALL-ACCESS PASS

Part of the promise of the future is total accessibility to all of our images all the time. We always hear talk about "cloud storage," but until it becomes practical to store everything on servers far, far away, it makes a lot of sense to set up a server-like system at home. And doing so is fairly simple, though it takes a bit more geeky patience than anything else I tried.

Buffalo's LinkStation Pro LS-XHL ($270, street, for 1TB) looks like your standard desktop hard drive. The only difference? It has an ethernet port on the back so you can hook it into your home network's Wi-Fi router. You can configure the drive using your web browser, renaming the server something more charming or reasonable than the string of letters and numbers it defaults to.

HOME AND AWAY: The beauty of Buffalo's LinkStation Pro LS-XHL is that it lets you access everything you've stored on it—from anywhere. All you need is a web browser and internet connection, and you can view, share, or download all of your photos.

Any computer on your home network can connect and store files on the LinkStation, as well as access and stream media stored on it. My favorite feature? Everything you put on the drive can be accessed from anywhere, via the web. I set up my Eye-Fi card to drop all the photos and videos it uploaded straight onto the LinkStation, thus rendering all of my files, RAW and JPEG alike, automatically accessible from anywhere I could get online.

MAPPING YOUR TRAVELS

Sure, the Eye-Fi can usually geotag photos taken in the U.S. based on a Wi-Fi signal, but you won't always be near one. And often enough the best photo locations are those unreached by civilization.

I was trying out my new high-tech-photographer life using the Nikon D90, so the Nikon's GP-1 GPS unit ($210, street) was a natural fit. A device just about the size of a box of Tic-Tacs, the GP-1 fits into your camera's hot-shoe and connects to your camera with a short cable. Once it finds a signal, it starts recording GPS data such as latitude and longitude, time of day, altitude, and even—when in motion, say in a car—your velocity into the metadata of your images.

Adding the GP-1 to my camera was incredibly simple. I made sure I had the right cord, plugged it in,

TAG, YOU'RE THERE: Who doesn't hate keywording image files? And when you're photographing off the beaten path, it's easy to lose track of where you shot what. Nikon's GP-1 GPS device, popped into the camera's hot-shoe, changes all that.

RICHARD KANE/FOTOLIA.COM (SCREEN IMAGE)

went for a walk, and started shooting. It took a few minutes to get the signal while indoors on a fairly densely populated city block, but I found one.

The one issue with such accurate GPS is privacy. In the end, I felt more comfortable using it when I was out on the town; I thought it might be wise to unplug for the pictures I took inside my house, especially since I was uploading everything and leaving many images for public consumption. I can't wait to take it with me when I travel, and let my software make a map of everywhere I've been.

MY NEW FUTURE LIFE

New technology is famously tricky at the outset—the first versions of the stuff that's supposed to make your life easier tend to make it worse until the technology matures.

What did I learn from my experiment? We are just about past the headache phase. On their own, each of the items I tried will smooth out some of the kinks in your workflow, but it was putting them all together that began to change the way I photograph.

Augmenting my kit with gear that streamlined all the stuff besides photography—uploading, labeling, sharing—had me picking up my camera more frequently. And why not shoot more if dealing with the images isn't going to be a pain? By the time I returned home from my shoot, all my pictures were already shared, stored, and backed up. It turns out that, by removing a good chunk of the process that didn't involve taking pictures, I removed an unconscious block I didn't know I had.

Nothing improves a photographer like practice. So maybe in the future we'll all be better photographers, simply because we'll have so much more time to shoot.

GET EVEN MORE CONNECTED

IF YOU SCORE AN EYE-FI CARD, A LINKSTATION PRO, AND A GPS DEVICE, YOU'LL BE PRETTY WELL SET UP. BUT AUGMENT THAT GEAR A BIT AND YOU CAN REALLY USE IT TO ITS FULL POTENTIAL.

•iPhone ▶

With my iPhone, I felt extra hooked up. Because my Eye-Fi card uploaded all my photos to Flickr, set to Private, I needed to go through and change a few permissions. Using Flickr's mobile browser, I did some editing and made some permission changes on my phone while I was waiting on line at a shop. And with Eye-Fi's iPhone app, you can change your settings and check your upload status while you're still out shooting. The LinkStation is optimized for the iPhone too, so you can log on through the iPhone's web browser to look through your photos and watch your videos.

•iPhoto

If you use a Mac, iPhoto '09 has some of the best and easiest-to-use mapping capabilities. It's simple to add your photos to a map, and from the map create Smart Albums. You can even make a travel book with your photos automatically grouped by location, and a supercool map that shows the steps you took on your journey.

•MiFi ▶

Want to be online all the time? Want to make sure your Eye-Fi card is always on the upload, even when you're nowhere near a Wi-Fi hotspot? Novatel's MiFi (www.novatelwireless.com), which starts at $40 a month for service, is about the size of a credit card and acts as a portable, pocket hub connecting over 3G cellular networks. Anywhere you'd get mobile reception, you can upload your pictures. ***—D.G.***

By Dan Richards

Dynamic RANGERS

How good is in-camera HDR?

DSLRs rarely lead the charge in camera innovation. Rather, it's often compacts that get first crack at new technologies—autofocus, built-in flash, and image stabilization, to name just a few. Here's another one: automated high-dynamic-range (HDR) imaging.

HDR uses information from two or more images of the same scene to produce a range of tones from highlight to shadow that would be impossible in a single exposure. Until recently, you had to do this in postproduction. But now there are at least two compacts that manage it in the camera with a press of the shutter: Fujifilm's 12MP Finepix F200EXR ($360, street) and Ricoh's 9.3MP CX1 ($369, direct from www.adorama.com). The first DSLR with this feature, the Pentax K-7, is just coming to market now.

■Doesn't Pop Photo have, um, *issues* with HDR? It's just that we see too many images taken to the Fakey McPhake level. When done subtly, HDR looks like a finely gradated but natural photo.

■How do these guys do it? The Ricoh takes two exposures in rapid succession (you hear one click), and combines the shadow and highlight details into a 9.3MP file. Just set DR on the mode dial; in the menu, you can choose very weak to very strong dynamic-range expansion.

The Fuji exploits its Super CCD EXR sensor, with 6MP of bright-light and 6MP of low-light sensors. The camera takes one picture, then combines the best of the highlight and shadow detail in a reduced 6MP file. Set EXR on the mode dial, then D-Range Priority in a menu. You can also select the expansion level—for the photo here, we used the highest: 800 percent. Both usurp ISO control. The Fuji sets ISO 200; the Ricoh adjusts sensitivity according to scene brightness.

COMPARE CONTRAST: This scene, taken with a Fujifilm F200EXR, shows the result without HDR (left) and with it (right).

■How are the results? Quite good. The Fuji tends to bring down the highlights; the Ricoh tends to pull up the shadows. We adjusted exposure compensation on each to roughly equalize exposures—at their strongest settings, both did nearly equally well. But the Ricoh maintained a full-size file.

■Any better than the shadow/highlight enhancement many compacts have? Yes. While some of those do boost dynamic range, they noise up the shadows a lot. Raise the ISO, and you get even more noise. But in the Fuji and Ricoh HDR shots, noise was very well controlled—it was nearly indistinguishable from that in their non-HDR images.

■So these two produce genuine HDR photos? Not by a long shot. True HDR images have much more range; both the Fuji and Ricoh produced blocked-up shadows and blown-out highlights in their HDR modes. But these modes provide a very useful on-the-spot fix for overly contrasty scenes—they could be especially useful for vacation travel photos, when you don't get to control your lighting. ✪

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The minimal, clearly marked buttons will make using the meter second nature in very little time. The side of the meter only has 3 buttons, the largest is for taking measurements, and the other two set on a rocker are UP/DOWN input buttons for changing F no., shutter speed or ASA/ISO. This simple, easy-to-use ergonomic design feels comfortable in your hand and its logical control layout and easy-to-read large LCD will please photographers who want to concentrate on the subject, not their equipment.

KENKO TELEPLUS EXTENSION TUBES

Extension tubes enable a lens to focus closer than its normal set minimum focusing distance. Getting closer has the effect of magnifying your subject (making it appear larger in the viewfinder and in your pictures). They are exceptionally useful for macro photography, enabling you to convert almost any lens into a macro lens at a fraction of the cost while maintaining original optical quality. Kenko Teleplus extension tubes have circuitry that pass all exposure and focus information between the lens and camera body.

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REBEL YELL

More, more, more of everything

▼ON THE BACK: A 3-inch LCD dominates the camera back with handily placed exposure compensation and live view buttons to its right. The menu control buttons also access frequently changed functions.

So you know a thing or two

about photography, or plan to learn, and want the best entry-level DSLR you can get? Then take a look at Canon's new EOS Rebel T1i.

We already knew that it's the first Rebel to shoot high-definition video. But now that we've run it through our battery of tests in the Pop Photo Lab, we can give you a better reason to check it out: Performance. The Rebel T1i beat its direct competitors in most areas of our tests, particularly in controlling noise as the ISO rises. And it does this while giving you more megapixels (15.1MP) than any other sub-$1,000 DSLR.

With a street price of $800, body only, or $900 with 18–55mm f/3.5–5.6 EF-S IS lens, it's also more expensive than its closest competitors.

More sensitivity

What does the extra dough get you compared with the Nikon D5000 ($810, street, with 18–55mm f/3.5–5.6 DX VR lens) and Olympus E-620 ($700, street, with Zuiko 14–42mm f/3.5–5.6 lens)? Not only lower noise at higher ISOs, but more ISO options. When set to its

WHAT'S HOT

- Low noise at higher ISOs.
- Nice 720p HD video recording.
- Fast autofocus.

WHAT'S NOT

- 1080p HD video is choppy at 20 fps.
- No built-in wireless flash control.
- Doesn't come with video-editing software.

WHO'S THIS FOR?

- First-time DSLR buyers who know something about photography and want a more powerful camera than the Rebel XS or XSi, or who want video capture in their DSLR.

expanded range, the Rebel T1i tops out at ISO 12,800—1 stop beyond the limit of the Nikon (ISO 6400) and 2 stops beyond that of the Olympus (ISO 3200).

Of course, at their highest ISOs, all of these cameras become overly noisy. But the Rebel T1i maintained a Low or better noise rating in our test all the way up to ISO 3200. Since that's the top standard ISO, as long as you don't turn ISO expansion on, you're golden.

Given that the T1i shares the same sensor as the more costly EOS 50D, it should come as no surprise that it also topped its competitors in resolution. It rated Extremely High (2380 lines) compared with their Very High scores under our new, more stringent, resolution criteria. Color accuracy was Excellent, with an average Delta E of 6.93.

More speed

In our version of speed trials—the autofocus test—the EOS Rebel T1i raced to the front of the pack. Its

IMAGE QUALITY: To capture this wall in Jackson Heights, NY, in late-evening light, ISO had to be bumped up to 3200 to keep some depth of field. But even so, noise was not heavy at all. Shot using an EF 24–70mm f/2.8L lens. Exposure: 1/160 sec at f/5.6, ISO 3200.

Photograph by NYI Graduate Jim Edds

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Jim had a successful career as a chemist, but it wasn't for him. He turned to photography, moved to the Florida Keys and became a member of NYI. From there it's been quite a ride. After working as an underwater photographer, he took up storm chasing. His video clips run regularly on the Weather Channel. Jim takes both still photographs and video under the most demanding conditions. At NYI, we have multi-media home study courses in photography for beginners, for emerging professionals, and for people who need to learn Adobe Photoshop. **Visit www.nyip.com for all the details.**

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9-point AF system locked on our target in a scant 0.32 seconds at the test's brightest light level of EV 12, and it still took less than a second even when the lights dimmed to the near-moonlit darkness of EV –1. That's a half-stop dimmer than the light level Canon says the AF system can handle. Indeed, in our test, the Rebel managed to zero in on the target in 1.18 sec at EV –2 (the least light we consider), while neither the Nikon nor the Olympus could focus at all in light that dim.

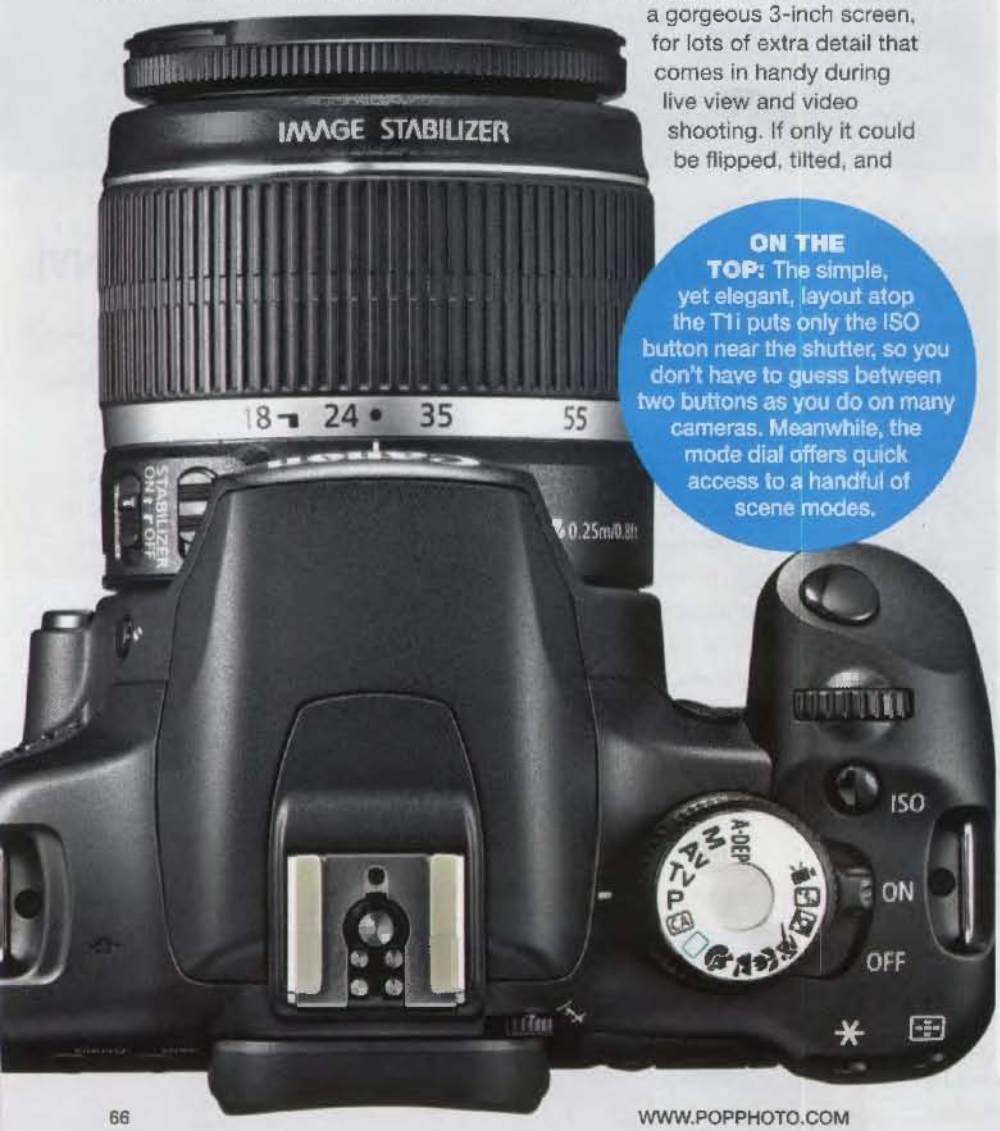
Buttons, dials, and controls are designed to make the camera quick and easy to operate. We appreciated finding the ISO button just behind the shutter, letting you change sensitivity on the fly. To avoid confusion, Canon put the exposure compensation button on the camera back, which also makes it easier to use in combination with the lone command wheel. (We wish there were two command wheels to make manual shooting more convenient, but you almost never find that setup on an entry-level DSLR.)

And, as on the Olympus E-620, Canon lets the menu control buttons double as access to frequently used functions, such as white balance, AF, drive mode, and Picture Styles (Canon lingo for JPEG profiles).

More features

The Rebel T1i's body construction is as solid as you can hope for in an entry-level DSLR. You won't find the weathersealing that you'll get with a pro body, but the grip and an area on the back for your thumb have a textured rubbery material that makes the camera comfortable to hold.

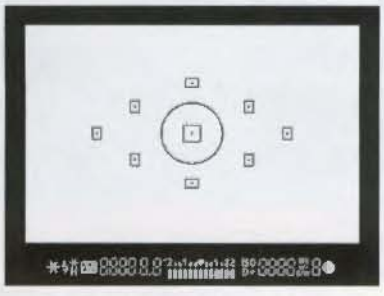
The LCD packs 920,000 dots into a gorgeous 3-inch screen, for lots of extra detail that comes in handy during live view and video shooting. If only it could be flipped, tilted, and



ON THE TOP: The simple, yet elegant, layout atop the T1i puts only the ISO button near the shutter, so you don't have to guess between two buttons as you do on many cameras. Meanwhile, the mode dial offers quick access to a handful of scene modes.

VITAL STATISTICS

IMAGING: 15.1MP effective, APS-C-sized CMOS sensor captures images at 4752x3168 pixels with 14 bits/color in RAW mode. **STORAGE:** SD and SDHC. Stores JPEG, RAW, and RAW + JPEG files. **BURST RATE:** Full-sized JPEGs (Fine mode): Up to 170 shots at 3.4 fps. RAW: Up to 9 shots at 3.4 fps (14-bit). **AF SYSTEM:** TTL phase detection with 9 illuminated focus points (1 cross-type). Single-shot, continuous with tracking, and auto-switching AF. Tested sensitivity down to EV –2 (manufacturer rated to EV –0.5) at ISO 100, f/1.4. **LIVE VIEW:** TTL phase-detection and contrast-detection AF modes. **SHUTTER SPEEDS:** 1/4000 to 30 sec, plus B (1/3- or 1/2-EV increments). **METERING:** TTL metering using 35-zone evaluative, centerweighted, partial (approx. 9% of viewfinder) and spotmetering (approx. 4% of viewfinder). EV 0–20 (at ISO 100). **ISO RANGE:** Normal, ISO 100–3200; expanded, ISO 6400 and 12,800 (in 1-EV increments). **FLASH:** Built-in pop-up with TTL autoflash with ±2-EV exposure compensation (1/3- or 1/2-EV increments). **VIEWFINDER:** Fixed eye-level pentamirror. **LCD:** 3-in. TFT with 920,00-dot resolution. **OUTPUT:** Hi-Speed USB 2.0, HDMI video, composite video. **BATTERY:** Rechargeable LP-E5 Li-ion, CIPA rating, 400 shots (50% with flash). **SIZE/WEIGHT:** 5.1x3.8x2.4 in., 1.06 lb with a card and battery. **STREET PRICE:** $800, body only; $900 with 18–55mm f/3.5–5.6 Canon EF-S IS lens. **FOR INFO:** canoneos.com.



VIEWFINDER ACCURACY: 95% (Excellent). **VIEWFINDER MAGNIFICATION:** 0.87X (High).

CERTIFIED TEST RESULTS

IMAGE QUALITY (ISO 100–3200)

RESOLUTION (ISO 100)

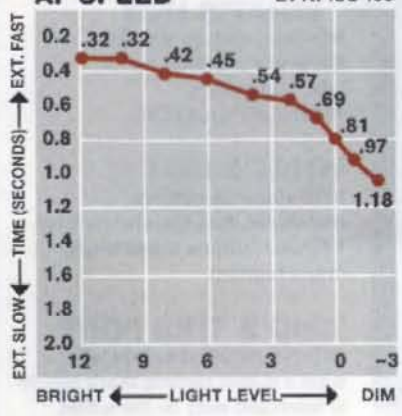
COLOR ACCURACY (AVG. DELTA E)

NOISE AT ISO

HIGHLIGHT/SHADOW DETAIL

CONTRAST (AT DEFAULT SETTING)

AF SPEED EV AT ISO 100



swiveled, like the smaller and lower-res monitors on the Nikon and Olympus.

Then there's video. The Rebel T1i can record at a pixel resolution of up to 1920x1080, the limit of the U.S. HD standard, though at that resolution the frame rate is a choppy 20 frames per second. But if you just turn down the resolution to 1280x720, you get 30 fps, which matches the frame rate of your HDTV—and isn't that where you want to watch it? At that setting, we got video that knocked our socks off.

As with all of the first generation of video-shooting DSLRs, you can't autofocus continuously during video capture. However, if you press the asterisk button on the camera back, the Rebel will focus once—press it again to focus on something else.

All that button-pushing is likely to make for shaky video if you're not careful. But if you plan your shots, use a tripod (preferably on a fluid head), and capture short snippets of video, you'll be amazed at the results—even when viewed unedited from the camera's built-in mini-HDMI output.

Live view shooting remains the same as on earlier models. You can choose from two types of AF: Contrast detection, though sluggish, maintains an uninterrupted view of your subject, while phase detection interrupts your view by closing the shutter, flipping down the mirror, focusing, then flipping the mirror up and opening the shutter—a clunky process. Still, live view can be useful for landscape, still-life, and macro work.

Bottom line

The image quality the Rebel T1i offers with its 14-bit RAW capture, Digic 4 processing, and accurate 35-zone metering is astonishing given its price. Just a few years ago, you couldn't hope to get talent like this for under $1,000. In all, an amazing first—or step-up—DSLR.

COMPETITIVE SET

NIKON D5000

$810, street, with 18–55mm f/3.5–5.6 DX VR lens

Though the Nikon D5000 just bested the Rebel T1i in color accuracy with its score of 6.73, Canon beat the Nikon in most of our other tests. The Reb was faster to focus in our AF test, an area in which Nikon usually excels. (As with color, the difference was minimal.) Resolution? A more noticeable divergence: The D5000's was 2245 lines (Very High), while the Rebel's was 2380 (Extremely High). But noise control is where Canon really wins. The Nikon had respectable results—Moderately Low or better up to ISO 1600—but the T1i kept noise to Low (one notch better on our scale) or better to ISO 3200, for an extra stop of low-light shooting that can make all the difference in a tough lighting situation. The Nikon's flip-down, swiveling LCD lets you handle certain live-view and video situations that the Canon, with a fixed LCD, can't. Still, we're giving this match to the T1i.

OLYMPUS E-620

$700, street, with 14–42mm f/3.5–5.6 Zuiko lens

In our tests, the less expensive Olympus E-620 couldn't keep up with the T1i. It kept noise to Moderately Low or better up to ISO 800. Resolution? It served up 2120 lines for a Very High rating. In color accuracy, the E-620's average Delta E of 7.9 barely snagged an Excellent rating. Low-light AF is where the E-620 really falls behind: At EV –1, the dimmest level in which it could focus, AF took 1.57 seconds to lock on our target, compared with 0.97 seconds for the Canon and a 1.02 for the Nikon. However, in very bright light, the Olympus beat both its rivals. It's also the only one of the three that can control off-camera hot-shoe flashes wirelessly. And while we give a slight edge to the Nikon's flip-down LCD, we still appreciate the versatility of the screen on the E-620, which flips to the side and swivels. Don't forget, the Canon's LCD doesn't move at all. And the Olympus, with a kit lens, costs $200 less (street) than the Rebel. So if you're not already invested in glass, you save a bit.

By Philip Ryan

STARTER Pistol

▼ON THE BACK: The tilting 2.7-inch LCD dominates, while the Fn button gives access to such settings as AF, metering, and white balance. Use the control pad to set ISO, flash, and drive mode.

Made to speed beginners out of the gate

Smack in the middle of a trio of new entry-level DSLRs from Sony, the 10.2MP Alpha 330 is an appealing option for photographers stepping up from compacts. A nice price ($650, street, with 18–55mm f/3.5–5.6 Sony DT SAM lens; $850, street, with an additional 55–200mm f/4–5.6 Sony DT SAM lens), fast autofocus, tilting LCD, and easy-to-understand controls are a few of its highlights. And it aced nearly all of our tests in the Pop Photo Lab.

Image quality

Typical of DSLRs these days, the A330 got an Excellent rating in our color accuracy test. With an average Delta E of 7.11, it handily beat our cutoff of 8 or below for top honors.

As have previous entry-level Sonys, the A330 also scored quite well in noise control. Using the manufacturer's RAW converter (Image Data Converter SR), and with the default level of noise reduction applied, it never rose above a Moderately Low noise rating. That's two steps above the bottom rung on our scale.

WHAT'S HOT

- In-body sensor-shift IS.
- Friendly interface for DSLR beginners.
- Tilting 2.7-inch LCD.

WHAT'S NOT

- No video recording.
- Less res than the competition.
- Fewer buttons mean more menu hunting.

WHO'S THIS FOR?

- First-time DSLR buyers who want a stylish camera that's simple to learn and easy on the wallet.

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Canon
EOS Speedlite 580EX II Flash
Built-In AF Assist Beam, E-TTL operation with all EOS digital SLRs, Search Newegg: 30-998-075

Canon
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Canon
PowerShot SX200 IS Red 12.1 MP
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At higher ISOs, Sony's noise reduction is quite aggressive and comes at the expense of real-world resolving power. Indeed, resolution was the one component of image quality in which the A330 fell behind its competitors. No surprise, since it starts out with fewer megapixels than most competing DSLRs, which have at least 12MP (the Canon EOS Rebel T1i, tested on page 64, leads the pack with a 15.1MP sensor).

At ISO 100, the A330's lowest sensitivity, it delivered 1970 lines of resolution (a High score) in our test. Once we reached ISO 3200, the default NR ate up 200 lines—not insignificant—for a result of 1770 lines. By way of comparison, the 12.3MP Olympus E-620 served up 1820 lines at ISO 3200, even with its default noise reduction applied.

Given the resolution, the A330 scores a Very High rating for overall image quality from ISO 100 through 400, pulled up a bit by its Excellent color accuracy and Very Low or better noise in that range. From ISO 800 through ISO 3200, overall image quality was High.

Autofocus and live view

The speed of the autofocus system is one arena in which the Alpha 330 shines. It focused faster than the Rebel T1i for the brighter half of our AF test, turning in a blazing 0.27 seconds at the brightest light level, EV 12. And while the Canon locked onto our target faster at EV 2, it wasn't by much—0.57 versus 0.63 sec for the Sony.

All the way down at murky EV –1, the A330 focused in a speedy 1.02 sec. That was the limit of the Alpha's AF system—in less light than that, it couldn't focus—while the Rebel was able to focus at EV –2, the dimmest level of our test.

Shooting in Live View mode? The Sony uses phase-detection AF, affording a much faster response, as the mirror doesn't have to flip in and out of the light path to allow the camera to focus on your subject. The downside? Because the Sony's live view comes from a separate sensor, you don't get 100-percent framing accuracy.

Handling and controls

Sony made major changes in the build and design of last year's entry-level offerings. Like the new A230 and A380, the A330 is smaller than its predecessor, the A300.

The grip has also been redesigned: Although the new grip is more stylish, with a cool, textured rubber finish, we miss the A300's ridge that you could tuck your middle finger under, and even more

ON THE TOP:
The on/off switch is now on a ring around the shutter button, but the Live View/Optical Viewfinder switch remains in place. Menu and exposure comp buttons are on an angled shoulder. And common scene modes are easy to find on the mode dial.
35 28 24 18
3.5-5.6/18-55 SAM
AUTO
P
LIVE VIEW
OVF
ON OFF
MENU
AV

COMPETITIVE SET

CANON EOS REBEL T1i

$800, street, body only; $900, street, with 18–55mm f/3.5–5.6 Canon EF-S IS lens

In the Pop Photo Lab and by the specs, this Canon beats the Alpha 330. It has significantly more resolution, thanks to its 15.1MP sensor. It focuses only ever-so-slightly slower than the Sony in bright light and just barely faster in very low light—but, more important, it can autofocus in extremely dim conditions where the Sony fails. The Canon also produces less noise across the ISO range and offers two stops more sensitivity by reaching ISO 12,800. Add to that the T1i's HD video capability, and bigger spenders have their decision made. Those of us on a budget, though, will end up thinking long and hard about the fact that the A330's dual-lens kit costs $50 less than the Canon's single-lens kit.

OLYMPUS E-620

$600, street, body only; $700, street, with 14–42mm f/3.5–5.6 lens; $800, street, with that lens, plus a 40–150mm f/4–5.6 zoom

This Olympus shares much with the A330, including sensor-shift IS and sensitivity spanning ISO 100 through 3200. Both demonstrated Excellent color accuracy in our tests and scored Very High overall image quality at lower ISOs. The Olympus couldn't keep up with the Sony's speedy AF, though, nor could it match its low noise. The E-620 did maintain more real-world resolving power than the A330, and we like its tilting and swiveling screen. Bargain hunting? Sony's single-lens kit costs $50 less than the equivalent Olympus kit, but its two-lens kit costs $50 *more* than the Olympus version.

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Tripod F-1328	63-3/4"	21.65"	24.2 lbs	3.96 lbs	$269.95
Monopod	55.11"	18.75"	11 lbs	10 oz.	$89.95
Ball Head F-1	-	-	8.8 lbs	11.5 oz.	$49.95
Ball Head F-2	-	-	11 lbs	14.4 oz.	$59.95
Ball Head F-3	-	-	17.6 lbs	16.1 oz.	$74.95

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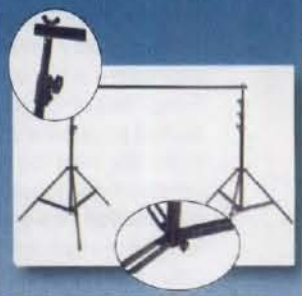

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IMAGE QUALITY: The A330's accurate color and pleasing auto white balance did an impressive job of capturing challenging purples and blues. Despite the high ISO, there's not much noise. Shot with 18–55mm f/3.5–5.6 kit lens. Exposure, 1/125 sec at f/5.6, ISO 1600.

the pronounced divot for the middle finger found on the A200. Your middle finger wraps over the top of the new grip, with your index finger resting on the shutter button. The older designs felt more comfortable when we rotated the camera or tilted it upward.

The control interface on the LCD is a radical departure. To appeal to novices who may be unfamiliar with camera jargon, Sony uses graphics: A shutter-speed scale shows an icon of a runner at the fast end and a stationary figure at the slow end. (We performed a nonscientific poll among non-SLR users, and they seemed to understand it.) The aperture scale depicts a person in front of a mountain—at the large aperture (small f-stop) end of the scale, the mountain is blurred to indicate shallow depth of field. If you don't like the scales, tap the display control on the touch pad and it'll revert to numerical versions, with a little more info about other settings such as white balance, AF, and metering modes.

A column of buttons on the left of the LCD was eliminated and those functions redistributed. Some are now on the control pad, while playback and trash get new buttons to the right of the LCD. The off/on switch for SteadyShot (sensor-shift image stabilization) was also eliminated—you now must jump into the main menu system to change its status. But if, like us, you leave it on unless you're panning or using a tripod, this is no big loss.

The 2.7-inch, 230,400-dot LCD tilts up and down, but it won't swivel the way those on the Nikon D5000 and most Olympus DSLRs do. Canon's Rebel T1i has a stationary monitor, but with a higher-res 920,000 dots.

Sony used to distinguish its DSLR kits from competitors by bundling them with an 18–70mm f/3.5–5.6 lens, longer than the 18–55mm range covered by Canon, Nikon, and Pentax kit zooms. Not anymore. The Alpha 330's kit lens spans exactly that standard range, equivalent to 27–82.5mm on a full-frame sensor (see our test on the next page). A second kit lens extends the reach to 200mm (300mm equivalent). Both of these sport Sony's Smooth Autofocus Motor (SAM).

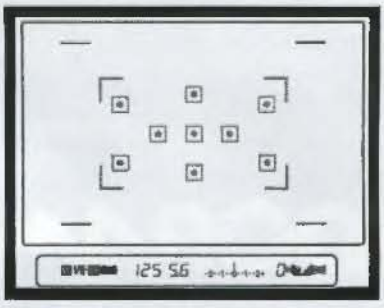
Bottom line

There are always tradeoffs to consider when choosing an entry-level DSLR. We find a flexible LCD more useful than video capture, but if you're a family shooter who likes to switch quickly between stills and movies, you may disagree and miss the video. Compose your shots in live view? You'll love the Alpha 330's speedy AF, which doesn't slow you down.

Ultimately, one of the best things about the A330 is the price. With a kit lens, it's the least expensive of all its competitors. That alone might make up your mind. ✪

VITAL STATISTICS

IMAGING: 10.2MP effective, APS-C-sized CCD sensor captures images at 3872x2592 pixels with 12 bits/color in RAW mode. **STORAGE:** Memory Stick PRO Duo, SD, and SDHC. Stores JPEG, ARW RAW, and RAW + JPEG files. **BURST RATE:** Full-sized JPEGs (Fine mode): Up to card capacity at 2.5 frames per second. RAW: Up to 6 shots at 2.5 fps (12-bit). **AF SYSTEM:** TTL phase detection with 9 illuminated focus points (1 center cross-type). Single-shot and continuous with tracking. Tested sensitivity down to EV –1 (manufacturer rated to EV 0) (at ISO 100, f/1.4). **LIVE VIEW:** TTL Phase detection. **SHUTTER SPEEDS:** 1/4000 to 30 sec plus B (1/3-EV increments). **METERING:** TTL metering using 40-segment honeycomb-pattern evaluative, centerweighted, partial and spotmetering. EV 2–20 (at ISO 100). **ISO RANGE:** ISO 100–3200 (in 1-EV increments). **FLASH:** Built-in pop-up with TTL autoflash with ±2-EV exposure compensation (1/3 EV increments), GN 33 (ISO 100, feet), covers 18mm lens field of view. Flash sync to 1/160 sec. Dedicated Sony/Minolta hot-shoe and wireless control of optional flash. **VIEWFINDER:** Fixed eye-level pentamirror. **LCD:** 2.7-in. TFT with 230,400-dot resolution. **OUTPUT:** Hi-Speed USB 2.0, mini HDMI video. **BATTERY:** Rechargeable NP-FH50 Li-ion, CIPA rating, 510 shots. **SIZE/WEIGHT:** 5.1x3.8x2.4 in., 1.1 lb with card and battery. **STREET PRICE:** $650 with 18–55mm f/3.5–5.6 Sony DT SAM lens; $850 with 18–55mm f/3.5–5.6 and 55–200mm f/4–5.6 Sony DT SAM lenses. **FOR INFO:** www.sonystyle.com.



VIEWFINDER ACCURACY: 95% (Excellent). **VIEWFINDER MAGNIFICATION:** 0.74X (Acceptable).

By Julia Silber

KIT King

CERTIFIED TEST RESULTS

IMAGE QUALITY (ISO 100–400)

VERY HIGH

POOR ⟷ EXCELLENT

RESOLUTION (ISO 100)

HIGH 1970

1500 2000 2500 3000 3500 4000

HIGH ⟷ EXCELLENT

COLOR ACCURACY (AVG. DELTA E)

EXCELLENT 7.11

14 12 10 8 6

HIGH ⟷ EXCELLENT

NOISE AT ISO

0.9 EXTREMELY LOW	100
1.3 VERY LOW	200
1.5 VERY LOW	400
2.3 MODERATELY LOW	800
1.6 LOW	1600
2.2 MODERATELY LOW	3200

3.0 2.5 2.0 1.5 1.0 0.5

UNACCEPTABLE ⟷ EXTREMELY LOW

HIGHLIGHT/SHADOW DETAIL

EXTREMELY HIGH

LOW ⟷ EXT. HIGH

CONTRAST (AT DEFAULT SETTING)

SLIGHTLY HIGH

LOW ⟷ HIGH

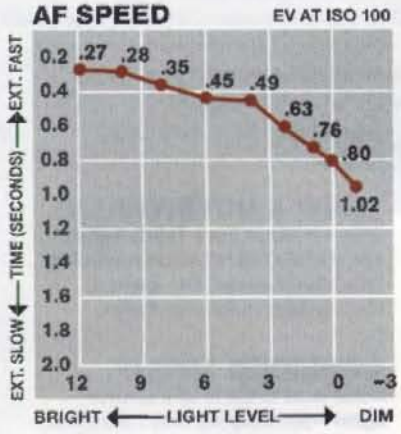
IMAGE STABILIZATION

2.5 STOPS

1 2 3 4 5 6

TESTED AT 200MM

AF SPEED EV AT ISO 100



Sony DT 18–55mm f/3.5–5.6 SAM AF

This new entry level wide- to-moderate-tele kit zoom ($200, street) was unveiled with the Sony Alpha 230, 330, and 380 cameras and is designed for APS-scaled sensors. A 27–82mm full-frame equivalent, it boasts Sony's relatively new Smooth AF Motor (SAM).

HANDS ON: Slightly more compact than comparable kit zooms from Canon, Nikon, and Pentax, it cast no shadow at any focal length when used with the A330's built-in flash. It sports Sony's Zeiss-inspired extra-fine ribbing on the zoom ring, which, like the manual-focusing ring, has a smooth and adequately damped turning action. Both rings are clad in rubber—unusual for a kit lens. Like most others in this class, however, the lens has no hood or distance- and depth-of-field scales. Nor does it have a nonrotating filter ring, making some lens-mounted filters and accessories hard to use. On an A330 body, AF was fast, accurate, and virtually silent.

IN THE LAB: SQF tests of resolution and contrast produced results in the Excellent range at three tested focal lengths—about what we expected.

DxO Analyzer Version 3.2 tests found Visible barrel distortion at 18mm (0.50%), and imperceptible pincushion distortion (0.02%) at 35mm and 55mm. Strong numbers, but, again, average by today's standards, and near matches to those of Canon and Nikon's wide-angle kit zooms. Light falloff left the edges by f/5.6 at 18mm, and we saw no visible vignetting at 35mm or 55mm. This is significantly better than the comparable Canon and Nikon lenses, which vignetted at all focal lengths.

Maximum subject magnification ratios at the constant close-focusing distance of approximately 9 inches were 1:6.7 at 18mm, 1:3.67 at 35mm, and 1:2.37 at 55mm. Good news for close-up fans.

CONCLUSIONS: This kit zoom is among the sharpest and least distorting of Sony's DT family of DSLR optics. That it's also the least expensive just adds to its attraction.

Specifications

18–55mm (18.59–54.18mm tested), f/3.5–5.6 (f/3.35–5.82 tested), 8 elements in 7 groups. Focusing turns 60 degrees counterclockwise. Zoom ring turns 80 degrees counterclockwise. Focal lengths marked at 18-, 24-, 28-, 35-, and 55mm. ■ **Diagonal view angle:** 76–29 degrees. ■ **Weight:** 0.49 lb. ■ **Filter size:** 55mm. ■ **Mounts:** Sony and Minolta AF. ■ **Street price:** $200.

Subjective Quality Factor

By Dan Richards

PROMISE Kept

A digital single-lens ...compact

ON THE BACK: The Olympus E-P1's big 3-inch LCD screen is complemented by a unique barrel-scroll wheel. The camera also sports a traditional scroll wheel and an ample array of control buttons.

This gorgeous little camera is not technically a compact model. Compacts, by general agreement, have fixed lenses. And the new Olympus E-P1 is a 12.3MP Micro Four Thirds camera that accepts interchangeable lenses, just like the Panasonic Lumix DMC-G1 and GH1.

But put the new Olympus next to one of those and you'd never guess that they came from the same era, let alone that they share the same system standards. The E-P1 forgoes both an electronic viewfinder and built-in flash to maintain a rangefinder look. Still, despite its size—just 4.74x2.75x1.37 inches—the E-P1 is loaded. Here's a rundown:

■**Still imaging.** The new TruePic V processing engine promises both more sharpness and better noise suppression in images from the Live MOS sensor. Sensitivity goes up to ISO 6400, versus ISO 3200 on current Olympus DSLRs. The six Art Filters from the E-620 (Grainy Film, Pinhole Camera, etc.) are carried over, as is multiple exposure (up to three frames). An in-camera fix, e-Portrait, automatically smoothes over skin wrinkles and flaws, reducing file size to 5MP in the process.

■**Video.** High-definition video of 1280x720 pixels at 30 frames per second, with digital image stabilization and continuous autofocus, can be recorded with CD-quality stereo audio via two built-in mics. You can apply Art Filters, plus any of five preset selections of background music, which can also be combined with live sound. And it plays video directly on an HDTV via an HDMI cable.

■**Controls.** The 324-zone evaluative metering has the most zones yet in an Olympus. A "normally open" shutter reduces lag to a stated 70ms, comparable to a DSLR rather than a pokey compact. Olympus says that the contrast-detection autofocus works twice as fast as the live-view AF in the E-620. An electronic level gauge can be superimposed on the LCD. As with Olympus DSLRs, the E-P1 has both sensor dust removal and sensor-shift image stabilization systems.

Early production samples of the E-P1 were very impressive in fit and finish. Front and back panels are stainless steel; top and bottom plates are aluminum alloy. The camera's 11.8-ounce heft is startling but also satisfying in this lightweight plastic era.

Olympus showed us two lenses: a 17mm f/2.8 pancake lens (which scales up to a 34mm equivalent with the Four Thirds System's 2X lens factor), and a 14–42mm f/3.5–5.6 zoom (28–84mm equivalent) that can be collapsed to protrude about two inches from the body. An accessory bright-frame finder for the 17mm lens allows fast eye-level shooting.

A very compact shoe-mount flash will be available, and the E-P1 will work with current Olympus TTL flash units. Adapters for both standard Four Thirds and Olympus OM-system lenses will be made.

No pricing had been set as of press time, but Olympus believes that it will retail for less than $1,000 with an unspecified lens. Stay tuned.

Penning the style

While it's tempting to call the Olympus E-P1 a rangefinder-style camera, it references an unconventional film-era SLR, the Olympus Pen F. Introduced in 1963, it was the world's first half-frame (18x24mm on 35mm film) single-lens reflex. Its unique viewfinder system employed a tiny porroprism rather than a pentaprism, creating an SLR with no prism bump. The "P" in E-P1 is a nod to the Pen F, and Olympus informally calls the new camera the digital Pen.

NEW & NOTEWORTHY

■Tiniest Micro Four Thirds camera yet. ■1280x720 HD video recording with stereo sound. ■In-camera fixes include electronic Botox.

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HANDS ON
Flashpoint F-1428 Carbon Fiber Tripod

By John Owens

STAND Tall

A three-legged proclamation

Chances are you don't

need the Flashpoint F-1428 Carbon Fiber Tripod ($330, direct; www.adorama.com).

After all, it supports up to 26 pounds of gear, and you'd be hard-pressed to find anyone short of a hardcore wildlife shooter whose camera and lens approaches that weight. Even a Canon EOS-1Ds Mark III with a hulking 400mm f/2.8 IS lens doesn't hit 15 pounds. Sure, video shooters can use this Prometheus-caliber support, but photo-retailer Adorama, which uses Flashpoint as its house brand, is promoting this 'pod to photographers like you and me. It's clearly a statement that Adorama wants to be taken seriously in the tripod category. Not mere low-cost gear, but good gear that runs right up to the 26-pound-supporting pro level.

And the F-1428 makes the case for itself pretty well. With four leg sections and a center column, it rises to 6 feet, yet closes down to 24 inches. At 5.56 pounds, its relative light weight comes from the carbon-fiber construction of the legs. A three-section aluminum model with similar capacity would be a pound or two heavier and several inches longer. Carbon fiber is also strong and not frostbite bait in the cold, as aluminum is.

Of course, there isn't just carbon fiber on this 'pod. The leg joints and collar are cast aluminum with a Gitzo-inspired gray crinkle finish. Bolts and the hook extending from the center column (hang ballast here) are stainless steel. The half-twist leg locks are rubber-covered aluminum.

In our field tests, everything worked smoothly and intuitively for both high and low camera positions—the legs splay out and the center tube reverses for get-down macro work.

In addition to tripods, Adorama has an impressive array of Flashpoint ballheads, gimbal heads, and quick-release plates to handle virtually any camera and application. While the best ballheads can cost $600-plus, the Adorama line of magnesium-alloy models is under $100. These Arca-Swiss-inspired heads are well made and reasonably smooth, but if you've been spoiled by the creamy action of a high-priced head, the savings probably won't compensate.

At $330, the F-1428 sells for less than half of what the platinum-caliber Gitzo GT2542L does, and it's priced more like a good aluminum model.

So what are the compromises? This Flashpoint lacks some of the smoothness of a top-end unit, and has a little extra weight here and there (for instance, the center column is aluminum, not carbon fiber; and the leg locks are quite large). Those fourth leg sections are thinner than you might have in a three-section tripod (which means less rigidity), and an annoying allen-key bolt is used on the quick-release plate (give us the old slot that takes a Japanese 100-yen coin or American nickel). Overall, however? This is not just a good tripod for the money, but a good tripod. ✪

BIG SUPPORTER: Built for heavy loads on various surfaces, the Flashpoint F-1428 Carbon Fiber tripod has rubber feet along with retractable spikes.

MOVIE MODEL: With high-def video coming out of your new DSLR, such as the Pentax K-7, where do you show your clips?

Which Video Site Should I Use?

I'm planning to buy a Pentax K-7, and want to shoot a lot of HD video with it. Which site is the best for uploading and sharing my videos?

The most obvious choice is YouTube—with millions of members, it's the largest and most widely used video-sharing site. But its popularity could also be its weakness. Anyone may post videos of anything from their cats to clips from TV shows, and the comments and ratings can quickly turn your video postings into an open forum for insults. Still, if your goal is to achieve overnight fame or get your videos viewed by the largest possible audience, YouTube is your best bet.

If, however, you are more concerned with the community, privacy, and video storage, consider Vimeo (www.vimeo.com). It limits playback to 25,000 instances, but this should be enough to share your work with a moderate-sized audience.

Vimeo's and YouTube's high-definition video posting have similar resolution and compression rates. But YouTube doesn't archive, while Vimeo offers an archiving service with its Plus account ($60 per year). This means that you can use the site as backup storage, since your original file is still stored even after your video is compressed for streaming.

The Plus account lets you upload up to 5GB of HD or standard-definition video a week (up to 1GB per video)—the free account allows only one HD clip per week. You also have the option of password-protecting your postings and otherwise limiting who views your content.

Perhaps the most appealing aspect of Vimeo is its community of 1.5 million registered users. With the popularity-contest feeling removed, you get a network of pro filmmakers and aspiring amateurs who foster a lot of warm and fuzzy encouragement. If you're learning the ins and outs of video with a DSLR, you'll find plenty of groups to answer your questions.

Vimeo has most of the usual features that you expect with a video-sharing site, such as the ability to embed videos in blogs, websites, and social networking sites. Plus, its learning tools and mature interaction might be enough to steer you away from the YouTube hive.

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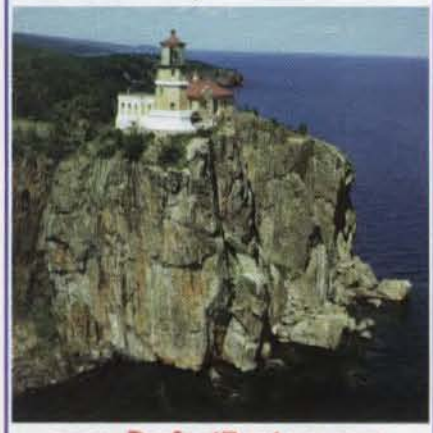

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By Julia Silber

BIG Daddy

Sigma 18–250mm f/3.5–6.3 DC OS HSM AF

At 13.8X, this digital-only

29–400mm equivalent (on DSLRs with 1.6X lens factors) offers the broadest zoom range of any Sigma lens. Joining Sigma's first digital-only superzoom of 2004, the 18–200mm, this $530 (street) lens adds optical stabilization (OS), four elements of super-low-dispersion glass (SLD), an internal focusing design that facilitates use of lens-barrel accessories, and an extra 50mm.

HANDS ON: Somewhat smaller (zoomed out) than Tamron's comparable 15X 18–270mm VC optic, this attractive, matte-black lens is compact at 18mm, and notably light. The zoom action is very smooth for a lens that nearly doubles in length as it racks out. The AF action (on the Canon EOS 50D) is rapid and sure, even in low light, and the HSM motor delivers near-silent autofocus. Manual focus is well damped, but inoperable in the AF mode. Well marked with easy-reading scales, the barrel also offers handy magnification ratios for its macro range.

IN THE LAB: On the Pop Photo optical bench, the lens produced SQF numbers in the Excellent range for the 18-, 35-, and 100mm focal lengths. As is common for superzooms, sharpness and contrast dipped at the longest focal length, here down two levels to Good. Performance is just a tad below Tamron's 18–270mm at the 11x14 magnification, our benchmark for sharpness and contrast.

DxO Analyzer Version 3.2 tests uncovered Slight barrel distortion at 18mm (0.29%) and Slight pincushion distortion at 35mm (0.27%), 100mm (0.20%), and 250mm (0.12%). The latter is very nearly in the Imperceptible range, a stellar job. At 18mm, Sigma bests the Tamron's 0.79% barrel distortion by a significant margin.

Light falloff was gone by f/5.6 at 18mm, f/6.3 at 100mm, and f/8 at 250mm, and the 35mm focal length produced no discernable falloff. That's an average showing and not up to the Tamron, which produced no vignetting at three of four zoom settings.

At the constant close-focusing distance of approximately 12.75 inches, maximum magnification ratios came in at 1:11.4 at 18mm, 1:7.1 at 35mm, 1:3.35 at 100mm, and 1:2.48 at 250mm. That longest zoom setting showed significantly more magnifying power than Sigma's published spec of 1:3.4.

Lab tests of the optical stabilization system for three different users discovered between one and three stops of extra handholdable sharpness, compared to non-OS shooting.

CONCLUSIONS: With its massive zoom range, optical stabilization, top notch AF, well-controlled distortion, and attractive macro performance, this handy lens has something for just about everyone.

SHARP SHOOTER: At 250mm (equivalent to 400mm on our Canon EOS Rebel T1i), Sigma's 18–250mm delivered a sharp image at 1/40 sec and f/6.2, thanks to its built-in optical stabilization.

Specifications

18–250mm (18.70–248.64mm tested), f/3.5–6.3 (f/3.17–n.a. tested*), 18 elements in 14 groups. Focusing turns 70 degrees counterclockwise. Zoom ring turns 80 degrees clockwise. Focal lengths marked at 18-, 24-, 28-, 35-, 50-, 80-, 135-, and 250mm.

- **Diagonal view angle:** 69–5 degrees.
- **Weight:** 1.43 lb. **Filter size:** 72mm.
- **Mounts:** Canon AF, Nikon AF, Pentax AF, Sigma AF, Sony AF. **Included:** Lenshood.
- **Street price:** $530. *NOT AVAILABLE DUE TO INSTRUMENT LIMITATIONS.

Subjective Quality Factor

18MM

Size	5x7	8x10	11x14	16x20	20x24
3.5	95.7	94.4	91.3	88.0	77.5
4.0	95.7	94.4	91.3	88.1	77.6
5.6	95.6	94.3	91.1	84.6	76.7
8.0	95.7	94.3	91.2	84.8	77.2
11.0	95.5	94.2	90.8	84.3	76.3
16.0	95.3	93.9	90.5	83.7	75.3
22.0	95.1	93.9	90.1	83.5	75.2

35MM

Size	5x7	8x10	11x14	16x20	20x24
4.5	95.9	94.7	91.7	85.8	78.4
5.6	96.0	94.8	91.9	86.0	78.9
8.0	96.2	95.0	92.3	87.0	80.6
11.0	96.1	95.0	92.2	86.8	80.3
16.0	95.9	94.7	91.7	85.9	78.8
22.0	95.2	93.8	90.3	83.1	74.1
29.0	94.8	93.4	89.7	81.4	70.9

100MM

Size	5x7	8x10	11x14	16x20	20x24
5.6	95.7	94.4	91.3	86.0	77.2
8.0	95.9	94.6	91.6	86.7	78.6
11.0	96.0	94.8	91.9	86.4	79.8
16.0	95.8	94.5	91.5	86.7	78.6
22.0	95.3	93.9	90.5	83.5	75.2
32.0	95.2	93.8	90.3	82.9	73.6
36.0	94.8	93.3	89.6	82.4	73.5

250MM

Size	5x7	8x10	11x14	16x20	20x24
6.3	94.7	93.2	90.1	85.8	77.1
8.0	95.0	93.5	90.6	87.5	79.5
11.0	95.2	93.9	91.0	88.4	80.9
16.0	95.1	93.8	90.8	88.1	80.3
22.0	94.7	93.4	90.3	86.8	78.6
32.0	93.8	92.3	89.0	85.2	76.8
40.0	93.3	91.8	88.4	84.5	76.1

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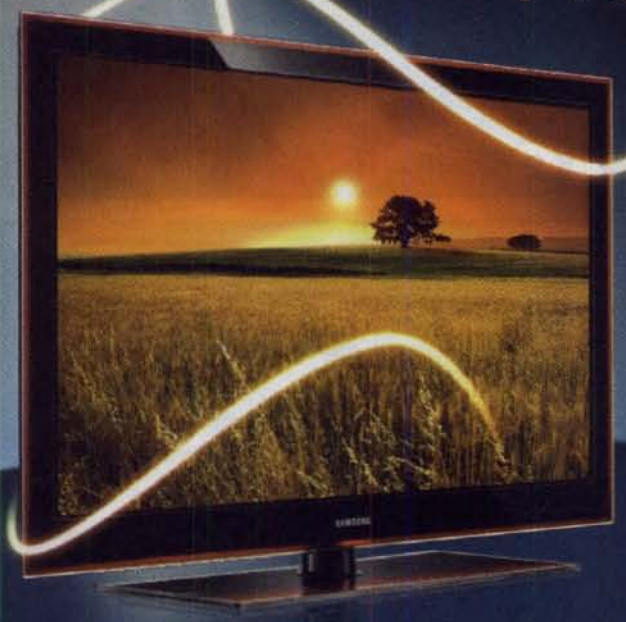

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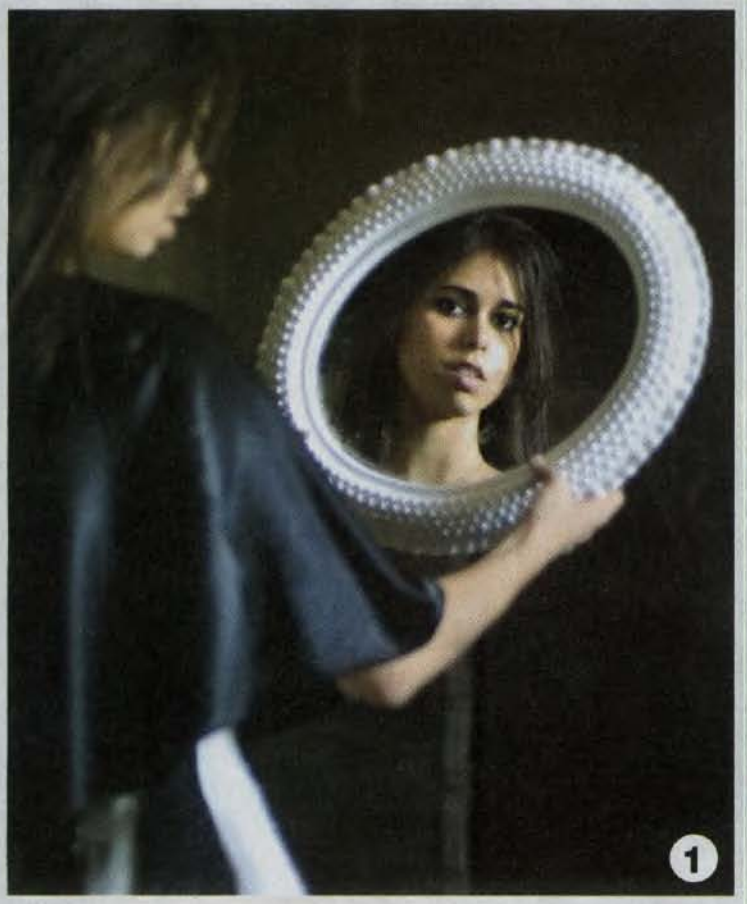

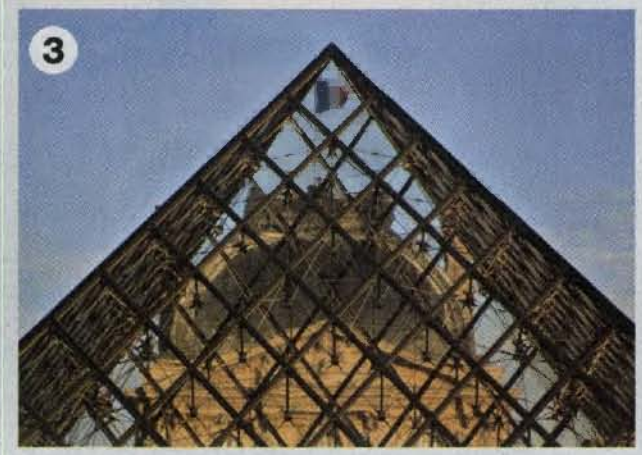

LINDSAY ADLER, WWW.LINDSAYADLERPHOTO.COM (3)

If you're simply using branches to frame a landscape, or a doorway to frame a portrait, your compositions aren't realizing their full potential. More complex framing devices can add compositional power to your pictures. Here are three examples:

1 Create a focal point. The mirror in this photo acts to focus attention on the center of interest—the reflection of the model's face. In this case, the frame is particularly effective because it outlines the mirror with a lighter tone, and our eyes tend to go to the lightest part of a photograph.

2 Establish context. This picture would still work without the legs of the Eiffel Tower because the streaming lines of the headlight trails would lead the viewer's eye to the building (the École Militaire). The legs, however, add a warm glow to the visual impact, focus the eye toward the center of interest, and make it clear that the scene is in Paris.

3 Layer graphic elements. An image of just the building and flag in the background of this photo would have been stagnant, as would have been an image solely of the glass pyramid (the top of the Louvre). By framing the background elements within the pyramid, the image becomes a dynamic graphic design.

—Lindsay Adler

Problem Solver

Project yourself: Projectors and projector screens are bulky, heavy, and often impractical if you want to show your images on the go. Several companies now make tiny "handheld" or "pico" projectors. These can project on any surface—they're great on a blank white wall, and in a pinch even a plain white T-shirt!

The Optoma PK-101 Pico ($300, street; www.optomausa.com) weighs just 4 ounces (including rechargeable battery), can fit in a shirt pocket, and can project images up to 60 inches across. While not able to hook into laptops, it can be connected into digital cameras and camcorders (via A/V cable), iPods (with the included dock connector), and Nokia camera phones (with an optional cable). *—L.A.*

ROAM THEATER: The Optoma PK-101 Pico projector measures only 2x4x0.6 inches.

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- 20X Digital Zoom
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Flash Memory Card Camcorder
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NEW!

COOLPIX P90

Unleashing Creative Freedom

A new 24x Zoom-NIKKOR lens for the COOLPIX P90 covers a broad focal range of 26mm wide-angle through 624mm super-telephoto (35mm format equivalent). The clarity of these precision optics combine with 12.1 effective megapixels and advanced Nikon digital image-processing to faithfully reproduce fine details and subtle tones, offering extended light sensitivity settings as high as ISO 6400 and image sensor shift VR image stabilization.

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COOLPIX S620

Fast. Friendly. Fantastic

Featuring response so quick that it frees photographers to confidently capture every special moment at will, the 12MP COOLPIX S620 is a finely crafted ultra-compact photographic tool that makes picture-taking a lot more fun. Performance features include the fastest start-up time in its class of a mere 0.7 seconds and a short shutter-release time lag.

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D5000 Smart. Sharp. Simply Brilliant

NEW!

The D5000 12MP DSLR Camera expands possibilities for photo and HD Video creativity with D-Movie mode, Vari-Angle LCD Monitor & 18 Automatic Scene Modes. It also incorporates a comprehensive set of in-camera editing features to make the most of captured images without the need of a computer.

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D90 Digital SLR

Engineered for Artistry

The D90 is the world's first digital SLR camera with a movie shooting function that delivers genuinely cinematic results, enhanced by the creatively shallow depth of field made possible by the DX-format sensor. This is further refined by the optical quality and broad selection of NIKKOR lenses - the same lenses relied upon by professional photographers the world over.

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D700 Digital SLR

Power that Empowers

The D700 offers pro-level performance and an extensive array of features and innovations in a comfortably nimble platform. In addition to the Nikon-original FX-format CMOS sensor, the D700 incorporates Nikon's EXPEED Image Processing System, Nikon's renowned 51-point auto focus system with 3D Focus Tracking, Scene Recognition System, a new active dust reduction system, two Live View shooting modes and more.

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Digital SLR's

Canon

NEW!

EOS DIGITAL REBEL T1i

The Journey Continues

In addition to an all-new 15.1 MP Canon CMOS sensor, DIGIC 4 Image Processor, a 3-inch Clear View LCD with anti-reflective and scratch-resistant coating, the EOS Rebel T1i adds remarkable Full HD video capture at resolutions up to 1920 x 1080. An HDMI port allows for quick connections to HDTVs and monitors for easy viewing of your stills and videos.

OLYMPUS

NEW!

E-620

Shoot Outside the Box

Six creative in-camera art filters, Multiple Exposure shooting and a swivel Live View 2.7" HyperCrystal III LCD offer artistic freedom and endless creative possibilities. The 12.3-MP Live MOS sensor & TruePic III+ processor provide exceptional picture quality. With in-body Image Stabilization, the E-620 is a camera that truly lets you shoot outside the frame.

PENTAX

K2000 Kit

Be Interesting

This limited availability 10Mp fun and very stylish K2000 camera package includes 18-55mm and 50-200mm lenses. Its Shake Reduction system is compatible with any PENTAX lens ever made, and minimizes the effect of camera shake even at slower shutter speeds. Additional features include Advanced Auto Picture, a 2.7 inch High-resolution LCD, High ISO of 3200 and more.

TAMRON

IN STOCK

AF 18-200 f3.5-6.3 XR Di II LD Aspherical (IF) Macro

The Powerful Zoom Range Exclusively for Digital SLR's

The new AF18-200 is a high power zoom lens made for exclusive use with digital SLR cameras. It covers a powerful zoom range equivalent to 28-300mm on a digital SLR camera with a smaller-size imager. The lens provides the convenience of handling many photographic scenes and the capability of shooting ultra wide-angle to ultra telephoto shots without changing lenses.

Camcorders

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ZR960

Affordable Performance

The ZR960 combines legendary Canon lens optics with the DIGIC DV Image Processor and a 680k Pixel CCD image sensor to deliver a full range of image quality. The ZR960 is specifically designed to make it easier to capture great video, with Canon's 41x Advanced Zoom, Image Stabilization, Quick Start, compatibility with optional Canon Lens Converters and Filters, a 2.7" Widescreen LCD with a Soft LCD video light, Joystick control, Level and Grid Markers and more.

FS200 NEW!

Fast, Flexible, Flash Memory

Canon's FS200 Flash Memory camcorder offers one of the most affordable ways to get stunning video in a light, compact and user-friendly package. Adding to the usefulness of this camcorder is Canon's Quick Charge - which reduces the recharge time for the FS200's battery and Pre-Record gives you a head start on capturing the action. The FS200 is a Flash Memory camcorder that's hard to beat and still unmistakably Canon.

Vixia HF200

FULL HD 1080

Setting a New Standard for High Definition

The VIXIA HF200 delivers brilliant video and still photos through Canon's 3.69 Megapixel CMOS image sensor and DIGIC DV III image processor. It is ultra lightweight and brings the ease and convenience of Flash Memory. This technology, the same used in advanced laptop computers, MP3 players, PDAs and cell phones, allows the VIXIA HF200 to record up to 6 hours of crisp, high definition video (LP Mode) to a removable flash memory card.

Vixia HV40

FULL HD 1080

Shoot. Capture. See. Be HD.

NEW!

The Canon VIXIA HV40 HDV Camcorder shares the core components found within the VIXIA line, but also offers a Genuine Canon 10x HD Video Lens and 2.96 Megapixel Full HD CMOS Image Sensor. It also allows consumers to record in native 24p Mode, a feature previously found only on Canon's professional camcorders. Native 24p allows consumer to capture and record 24 progressive frames per second to a HDV tape, a big advantage for the serious filmmaker.

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D700 — 12.1 MEGAPIXEL
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EOS REBEL XS
- Canon's EOS Integrated Cleaning System
- Live View Function
- Powerful DIGIC III Image Processor

NEW! Canon EOS REBEL T1i — **15.1** MEGAPIXEL
FULL HD VIDEO CAPTURE
- DIGIC 4 Image Processor
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- Live View Function for stills (Quick, Live and Face Detection AF modes) and video

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EOS 50D
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EOS 5D Mark II — **21.1** MEGAPIXEL
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Nikon COOLPIX

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24X OPTICAL WIDE-ANGLE
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- 4-Way VR Image Stabilization

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WATERPROOF, DUSTPROOF & SHOCKPROOF
- 28mm wide-angle LEICA lens
- AVCHD format
- Intelligent Auto Mode

DMC-FZ28K — **10.1** MEGA PIXEL — **18X** ZOOM
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DMC-LX3K — **10.1** MEGA PIXEL — **2.5X** ZOOM
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1

2

3

4

1. Color form: This graphic abstraction of a woman in a swimsuit was made by Japanese photographer Hideki Fujii as part of a series of images for a calendar. He used a 35mm SLR and a 180mm lens. The exposure, lit by electronic flash units, was 1/100 sec between f/11 and f/16 on Kodachrome 64 film. The printing process rendered the image more abstract—an unaltered version ran in our 1985 Photography Annual.

2. Weimar Berlin: This striking portrait of actress Lotte Lenya (who was also the wife of Kurt Weill) was taken in Berlin by noted German photographer Lotte Jacobi in 1930, a time when pre-Nazi Germany was seething with exciting innovations, particularly in the performing arts. This photo was shown in an exhibition of Jacobi's work depicting many of the stars who had to leave Germany after 1933.

3. Manhattan landmark: Maybe it takes an out-of-towner to make superb images of New York. In this case, the photographer was Robert Walker, a Canadian who moved to the city in 1978. He spent years shooting street scenes, including this look at Suerken's, a restaurant near City Hall dating back to the Gay Nineties and now gone forever.

4. Night over Seattle: Bryan F. Peterson advised that the best light comes at the end of the day, and this photo of Seattle proves his point. He used a 35mm SLR and slow (ISO 64) color film. His secret was very long exposures, up to several minutes in some cases, with the camera mounted on a tripod, of course.

1930 | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 | 2000

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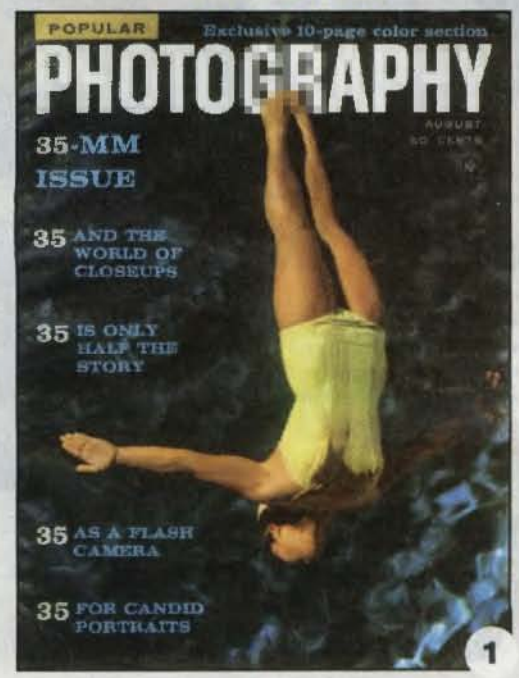

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3

4

1. Taking the plunge: The graceful dive of Kumiko Watanabe was captured by pro photographer Yoshikatsu Saeki at an indoor pool in Tokyo. He used a Topcon-R 35mm SLR with a 58mm f/1.8 Auto-Topcor lens. The exposure, on Kodak Ektachrome film, was 1/250 sec at f/8. He supplemented the available lighting with a #5 flashbulb.

2. Hasselblad wannabe: This new Zenza Bronica 2¼ SLR was intended to compete with Hasselblad as a top-level medium-format SLR. It offered several desirable features, including an instant-return mirror and excellent Nikkor lenses, but it lacked the rugged dependability of its rival. The Bronica came in at the same price as the Hasselblad 500C, $489.50, with 75mm f/2.8 Nikkor lens.

3. Breaking the rules: Pete Turner, shooting color almost exclusively, made this unusual picture using the double-exposure capability of his Rolleiflex. Each exposure was 1/50 sec at f/16 on Kodak Ektachrome daylight-type film. One exposure was sharp, the second was deliberately out-of-focus.

4. End of the line: This beautifully finished Zeiss Super Ikonta IV was the last 2¼ folder in a line that started in 1935 with the first Super Ikonta B. Boasting a Zeiss Tessar f/3.5 lens, Compur-Rapid shutter to 1/500 sec and built-in photoelectric exposure meter, the camera was bargain-priced at $79. Today, as a collectible, it's worth about three times its original price.

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- 4x Optical Zoom • 4x Digital Zoom
- 6.2-24.8mm f/2.7-5.6 (35mm equiv. 35-140mm) • SD/SDHC Card Slot
- Dimensions 3.76 x 2.46 x 1.22"
- Weight 5.47 oz

Blue, Green, Grey, Pink #CAPSA1100*

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- *Optical Image Stabilization*
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- 4x Optical Zoom • 4x Digital Zoom
- 5-20mm f/2.8-5.8 (35mm equiv. 28-112mm)
- SD/SDHC Card Slot • Face Detection
- Dim. 3.85 x 2.12 x 0.87" • Weight 5.11 oz

Blue, Gold, Pink, Silver #CAPSSD960*

Canon Powershot SD1200 IS
- *Optical Image Stabilizer System*
- 10.3 MegaPixels • 2.5" LCD Monitor
- 3x Optical Zoom • 4x Digital Zoom
- 6.2-18.6mm f/2.8-4.9 (35mm equiv. 35-105mm) • SD/SDHC Card Slot
- Dim. 3.48 x 2.16 x 0.86" • Weight 4.23 oz

Blue, Dark Grey, Light Grey, Green, Orange, Pink #CAPSSD1200*

Canon Powershot G10
Optical Image Stabilizer System
- 14.7 MegaPixels • 3" LCD Monitor
- RAW File Mode • E-TTL Flash Hot Shoe
- 5x Optical Zoom • 4x Digital Zoom
- 6.1-30.5mm f/3.2-5.9 (35 equiv. 28-140mm)
- SD/SDHC (High Capacity) Card Slot
- Dimensions 3.1 x 4.3 x 1.8"
- Weight 12.3 oz

#CAP5G10*

FUJIFILM FinePix S5100
- *New SR AUTO & Face Detection*
- 10 MegaPixels • 2.7" LCD Monitor
- 12x Optical Zoom • 5.7x Digital Zoom
- 5.9-70.8mm f/2.8-6.4 (35 Equiv. 33-396mm)
- SD/SDHC Card Slot • Instant Zoom
- 23MB Built-in Memory
- Dimensions 4.1 x 2.9 x 2.7"
- Weight 11.4 oz

#FUFPS1500*

Nikon Coolpix S60
- *Optical VR Image Stabilization*
- 9.0 MegaPixels • 3" LCD Monitor
- 3x Optical Zoom • 4x Digital Zoom
- 6.3-18.9mm f/3.3-4.2 (35 Equiv. 38-114mm)
- SD/SDHC Card Slot • 38MB Built-in Memory
- Dim. 3.6 x 2.3 x 0.9" • Weight 4.4 oz

Black, Bronze, Burgandy, Pink, Red, White #NICPS60*

Nikon Coolpix P90
- *4-Way VR Image Stabilization*
- 12.1 MegaPixels • 3" Vari-Angle LCD
- 24x Optical Zoom
- 4.6-110.4mm f/2.8-5 (35mm Equiv. 24-624mm)
- SD/SDHC Card Slot • 47MB Built-in Memory
- Dimensions 3.3 x 4.53 x 3.9"
- Weight 16.2 oz

#NICPP90*

OLYMPUS Stylus Tough-6000
- *Shockproof, Waterproof, Freeze proof*
- *Dual Image Stabilization*
- 10 Megapixels • 2.7" LCD Monitor
- 3.6x Optical Zoom • 5x Digital Zoom
- 5-18.2mm f/3.1-5.9 (35 Equiv. 28-102mm)
- xD card slot • 42MB Internal Memory
- Dim. 3.8 x 2.5 x 0.88" • Weight 5.3 oz

Blue, White, Yellow #OLST6000*

OLYMPUS Stylus 7000
- *Dual Image Stabilization*
- 12 Megapixels • 3.0" LCD Monitor
- 7x Optical Zoom • 5x Digital Zoom
- 6.6-46.2mm f/3.5-5.3 (35mm Equiv. 39-260mm) • In Camera Panorama
- xD card slot • 16MB Internal Memory
- Dimensions 3.8 x 2.2 x 1" • Weight 4.7 oz

Black, Blue, Silver #OLS7000*

Panasonic Lumix DMC-LX3
MEGA O.I.S. (Optical Image Stabilizer)
- 10.1 MegaPixels • 3.0" LCD Monitor
- 2.5x Optical Zoom • 4x Digital Zoom
- 5.1-12.8mm f/2-2.8 (35 Equiv 24-60mm) Leica Lens • RAW File Mode
- SD Card Slot • 50MB Built-in Memory
- Dim. 2.4 x 4.3 x 1.1" • Weight 8 oz

Black, Silver #PADMCLX3*

PENTAX Optio W60
- *JIS Class 8 Waterproof to 13'*
- *Face Recognition • HD Movie Capture*
- 10 MegaPixels • 2.5" LCD Monitor
- 5x Optical Zoom • 5.7x Digital Zoom
- 5-25mm f/3.3-4 (35 Equiv. 28-140mm) Lens • SD/SDHC (High Capacity) Card Slot
- Dimensions 2.2 x 3.9 x 1" • Weight 4.4 oz

Ocean Blue, or Silver #PEOW60*

SONY CyberShot DSC-HX1
- 9.1 MegaPixels • 3" LCD Monitor
- 2x Optical Zoom • 26x Digital Zoom
- 5-100mm f/2.5-5.6 (35 Equiv. 28-260mm) G-Lens • MS Duo/Pro Duo Card Slot
- HD Video Recording • Sweep Panorama Mode • Handheld Twilight Mode
- Dimensions 4.63 x 3.38 x 3.63"
- Weight 18 oz

#SODSCHX1

SONY CyberShot DSC-T90
- *Super SteadyShot® image stabilization*
- 12.1 MegaPixels • 3.0" LCD Monitor
- 4x Optical Zoom • 2x Digital Zoom
- 6.8-24.7mm f/3.5-4.6 (35 Equiv. 35-140mm) Carl Zeiss Vario-Tessar Lens
- MS Duo/Pro Duo Card Slot
- Dim. 3.75 x 2.375 x 0.8" • Weight 5.3 oz

Black, Blue, Pink, Silver, Titanium #SODSCT90*

SONY CyberShot DSC-H20
- *Super SteadyShot® image stabilization*
- 10.1 MegaPixels • 3.0" LCD Monitor
- 10x Optical Zoom • 2x Digital Zoom
- 6.3-63mm f/3.5-4.4 (35 Equiv. 38-380mm) Carl Zeiss Vario-Tessar Lens
- MS Duo/Pro Duo Card Slot
- Dimensions 4.25 x 2.75 x 1.875"
- Weight 9.8 oz

#SODSCH20*

Memory Cards

CF Compact Flash

	Delkin		Kingston		Lexar			Sandisk			Sony	
	Std	Pro	Std	Ultimate 133x	Ultimate 266x	Platinum II	233x	300x	Ultra II	Extreme III	Extreme IV	133x	300x
1GB	13.95	19.50	—	—	—	—	—	—	—	—	—	—	—
2GB	14.50	28.50	—	—	—	—	—	24.95	14.95	—	—	34.95	—
4GB	19.95	43.95	18.95	18.95	49.95	—	34.95	58.95	24.95	33.95	64.95	—	68.50
8GB	26.95	76.50	—	26.50	82.95	—	54.95	109.95	39.00	54.39	134.00	—	132.95
16GB	44.50	149.95	—	39.95	129.95	77.95	—	189.95	—	101.95	203.95	—	—
32GB	84.95	—	—	—	—	—	—	—	—	199.95	—	—	—

MSDUO Memory Stick Pro Duo

	Lexar	Sandisk				Sony
	40x	Standard	Ultra II	Ultra II Mobile	Gaming	Mark II
1GB	—	—	—	—	16.95	16.95
2GB	19.50	17.95	24.50	—	—	—
4GB	22.95	19.95	33.95	129.95	29.95	22.95
8GB	42.95	34.95	49.95	—	—	36.50
16GB	—	—	103.50	—	—	79.95

SD Secure Digital

	Delkin				Kingston	Lexar		Sandisk			Panasonic		
	Standard	Pro	Micro	Mini	Standard	Platinum II 60x	133x	Standard	Micro	Micro Ultra	SMBs Class 2	SMBs Class 4	20MBs Class 6
1GB	8.95	—	9.50	—	—	—	—	—	7.95	14.95	7.50	—	—
2GB	9.95	13.95	9.95	12.50	7.50	14.95	23.50	7.95	—	—	—	8.50	14.50
4GB	—	—	—	24.95	—	—	—	—	—	—	—	—	—
8GB	—	—	—	34.50	—	—	—	—	—	—	—	—	—

XD xD Memory

Type M	1GB	2GB
Fuji	17.95	24.95
Olympus	M+ 14.99	M+ 19.95
Sandisk	18.95	—

SD HC Secure Digital High Capacity

	Delkin Pro Class 6	Kingston Standard Class 2	Kingston Standard Class 4	Kingston Class 6	Lexar Standard Class 2	Lexar Platinum II 60x Class 6	Lexar 133x Class 6	Panasonic 6 MBs Class 6	Panasonic 10 MBs Class 4	Panasonic 20 MBs Class 6	Sandisk Standard Class 2	Sandisk Ultra II Class 4	Sandisk Ultra II Class 6	Sandisk Extreme III – Class 6 20MBs	Sandisk Extreme III – Class 6 30MBs	Sandisk Micro Class 2
4 GB	16.50	13.95	12.95	14.50	9.99	22.50	34.95	—	12.95	24.50	9.95	—	19.95 *	34.95	44.00	19.95
8GB	24.95	22.95	21.95	23.50	18.95	34.95	61.95	43.95	—	—	19.95	34.95 *	—	54.95 *	74.00	—
16 GB	43.95	—	33.95	—	—	59.95	—	—	—	89.50	—	59.95 *	* with Reader		122.00	—
32 GB	110.95	—	—	—	—	—	—	—	—	272.95	—	—	—	—	—	—

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- Shadow Adjustment • USB 2.0
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- Supersonic Wave Filter Anti-dust System • 7-point AF System
- 6 Art Filters & Multiple Exposure

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Kit with 14-42mm Zuiko Lens ..... #OLEE6201442
Kit with14-42mm and 40-150mm Lenses ..... #OLEE6202LK

12 MegaPixels

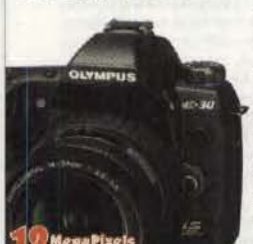
PENTAX K2000D Super
"D-SLR" Digital SLR Camera

- *Dust Reduction & Dust Alert Features*
- Convenient Scene Modes
- 10.2 Megapixels
- 2.7" LCD Monitor
- Uses Pentax AF Lenses (1.5x factor)
- SD/SDHC Card Slot
- Shake Reduction Technology
- Intuitive Operation
- Dedicated Help Button • USB 2.0
- ISO 100-3200 • 3.5 fps Burst

Kit with 18-55mm DA AL Lens and AF-200FG Flash ..... #PEK2000K

10 MegaPixels

OLYMPUS Evolt E30
"D-SLR" Digital SLR Camera



- *Capture in JPEG or RAW*
- *In-Body Image Stabilization*
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- 4/3 Full Frame Zuiko Specific Lenses
- CF & XD Dual Card Slots
- ISO 200-3200 • USB 2.0
- Shadow Adjustment
- 5 fps Burst • Face Detection
- Supersonic Wave Filter Anti-dust System • Scene Select Modes
- Art Filters & Multiple Exposure

E30 Body Only ..... #OLEE30
Kit with 14-42mm Zuiko Lens ..... #OLEE301442

12 MegaPixels

SONY Alpha A700
"D-SLR" Digital SLR Camera

- *Super SteadyShot image stabilization and dust reduction*
- 12.2 MegaPixels
- 3" LCD monitor
- SLR viewfinder
- Uses Sony Alpha (compatible with Minolta A-type bay mount) Lenses (1.5x factor) • 5 fps Burst
- CF & MS Card Slots • USB 2.0
- Auto or Manual Focus, Eye Start AF
- ISO 100-1600 (up to 6400 with Boost)

A700 Body Only ..... #SODSLRA700
Kit with 18-70mm ..... #SODSLRA700K
Kit with 16-105mm ..... #SODSLRA700P

12 MegaPixels

Panasonic Lumix DMC-G1
"D-SLR" Digital SLR Camera

Micro Four-Thirds System CCD

- 12.1 MegaPixels • Electronic viewfinder
- 3" free-angle LCD Monitor
- Full-time Live View with Contrast AF
- Uses 4/3 Full Frame Leica-Panasonic-Olympus Lenses (1.5x factor)
- Creative Color Modes • USB 2.0
- Intelligent Auto Mode
- High Sensitivity (ISO 3200)
- SD/SDHC Card Slot • HDTV Output
- Self Cleaning Sensor

Black with 14-45mm ..... #PADMCG1KB
Blue with 14-45mm ..... #PADMCG1KBL
Red with 14-45mm ..... #PADMCG1KR

12 MegaPixels

SONY Alpha A900
"D-SLR" Digital SLR Camera

- *Dual BIONZ processing engines*
- *In-Camera Image Stabilization*
- 24.6 MegaPixels 35mm full-frame sensor • 5 fps Burst • USB 2.0
- 3" LCD monitor • SLR viewfinder
- Uses Sony Alpha (compatible with Minolta A-type bay mount) Lenses (1.5x factor)
- CF & MS Card Slots
- 13 Creative shooting styles
- HDMI output & Photo TV HD mode
- Dust & Weather-Resistant
- ISO 100-6400

A900 Body Only ..... #SODSLRA900

24 MegaPixels

SLR Lenses & Flashes

OLYMPUS
50mm f/2 Macro ED Zuiko Digital Lens

- *Exclusively designed for use with Digital SLRs*
- ED glass element
- Ideal for not only macro photography but also as a portrait lens
- Minimum focus 9.45"
- 52mm filter diameter
- Weight 10.6 oz

PENTAX
50-200mm f/4-5.6 SMCP-DA ED AF Zoom Lens

- *Exclusively designed for use with Digital SLRs*
- 35mm equiv. 76.5-306mm
- Ideal for portraiture, sports and scenery
- Quick-Shift Focus System
- Minimum focus 3.6'
- 52mm filter diameter
- Weight 9 oz

SONY
HVL-F58AM Shoe Mount Digital Flash

- Guide No. 190'
- TTL Dedication
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- Zoom Head (24-105mm)
- Vari-Power
- Auto WB Adjustment
- High-Speed Sync
- Wireless Ratio Control
- Weight 15.6 oz

SONY
16-80mm f/3.5-4.5 Carl Zeiss Vario-Sonnar T* DT Lens

- *Exclusively designed for use with Digital SLRs*
- 35mm equiv. 24-120mm
- Ideal for snapshots, portraits, interiors or outdoor scenery
- Minimum focus 13.8"
- 62mm filter diameter
- Weight 15.5 oz

OLYMPUS

Flash System

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STF-22 Twin Flash Set	$689.95

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11-22/2.8-3.5 ED (72ø)	$749.95
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40-150/4-5.6 ED (58ø)	$251.95
50-200/2.8-3.2 ED SWD (67ø)	$1,149.95
90-250/2.8 ED (105ø)	$5,999.99
EC-14 1.4x Teleconverter	$409.95
EC-20 2x Teleconverter	$449.95
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PENTAX

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SMCP-DA Digital AF Lenses

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AF Lenses for 35mm & Digital SLRs

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SONY

Compatible with Maxxum D-SLRs
Flash System

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Digital Lenses

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18-250/3.5-6.3 DT (62ø)	$579.99
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70-200/2.8 G APO (77ø)	$1,799.99
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"D-SLR" Digital SLR Camera

- 10 MegaPixels CMOS Sensor
- 2.5" LCD Monitor
- Live View Function
- SLR viewfinder
- Uses Canon EF Lenses (1.6x factor)
- SD/SDHC (High Capacity) Card Slot
- Auto Lighting Optimizer
- 3.0 fps Continuous Shooting
- ISO 100-1600 • USB 2.0
- Picture Style Settings
- Integrated Cleaning System

Digital Rebel XS Kits
Black Kit with 18-55mm IS **#CAEDRXSKB**
Silver Kit with 18-55mm IS **#CAEDRXSKS**

Canon EOS-50D
"D-SLR" Digital SLR Camera

- *RAW and sRAW Image Capture*
- 15.1 MegaPixels
- 3.0" Clear View VGA LCD
- Live View Function • SLR viewfinder
- Uses Canon EF Lenses (1.6x factor)
- CF Card Slot • USB 2.0
- "Picture Style" Settings
- Versatile Exposure Metering System
- HDMI output that enables the display of your photographs on any HDTV with HDMI ports

Body Only ..... **#CAE50D**
Kit with 28-135mm IS USM Lens ..... **#CAE50D28135**

Canon Digital Rebel XSi
"D-SLR" Digital SLR Camera

- 12.2 MegaPixels CMOS Sensor
- 3" LCD Monitor
- SLR viewfinder
- Live View Function
- Uses Canon EF Lenses (1.6x factor)
- SD/SDHC (High Capacity) Card Slot
- Auto or Manual Focus
- 3.5 fps Continuous Shooting
- ISO 100-1600 • USB 2.0
- Picture Style Settings
- Integrated Cleaning System

Body Only (Black or Silver) ... **#CAEDRXSI***
Kit with 18-55mm IS ..... **#CAEDRXSIK***

Canon EOS-5D Mark II
"D-SLR" Digital SLR Camera

- *Record HD Video*
- *1080p Movie Mode*
- 21.1 Megapixel Full-Frame Sensor
- 3.0" High Resolution LCD Display
- SLR viewfinder • Live View Mode
- Uses Canon EF Lenses
- CF, MD Card Slot • USB 2.0
- Dust & Weather-Resistant
- Self Cleaning Sensor
- 3.9 fps Burst Mode
- 9-point AF Sensor Array
- ISO Range 50-25600

Body Only ..... **#CAE5D2**
Kit with 24-105mm IS ... **#CAE5D224105**

Canon Digital Rebel T1i
"D-SLR" Digital SLR Camera

New

- *HD 1080p, 720p, and VGA Video Capture*
- 15.1 MegaPixels CMOS Sensor
- 3" Clear View LCD with Live View
- Uses Canon EF Lenses (1.6x factor)
- SD/SDHC Card Slot
- Auto or Manual Focus
- 3.4 fps Continuous Shooting
- ISO Expandable to 12,800
- RAW and/or JPEG

Body Only ..... **#CAEDRT1I**
Kit with 18-55mm IS ..... **#CAEDRT1IK**

Canon EOS-1D Mark III
"D-SLR" Digital SLR Camera

- *Weather Resistant Body*
- *Self-Cleaning Sensor*
- 10.1 MegaPixels
- SLR viewfinder
- 3" LCD Monitor with Live View
- Uses Canon EF Lenses
- SD/SDHC & CF card slots
- 10 fps up to 110 shots in JPEG mode
- Picture Style Settings
- Fast AF system • USB 2.0
- Powerful Bundled Software
- ISO 100-3200 (expandable to 50 and 6400)

Body Only ..... **#CAE1D3**

SLR Lenses & Flashes

Canon 580 EX II Shoe Mount Flash

- Guide No. 190'
- Dust- & water-resistance
- Metal Hot Shoe
- Superior build quality, including a metal foot for higher rigidity
- E-TTL II, E-TTL, TTL & Manual
- Bounce & Swivel Head
- Zoom Head (24-105mm)

Canon 10-22/3.5-4.5 EF-S USM Digital Lens

- *Exclusively designed for Digital SLRs*
- 35mm equivalent 16-35mm
- 3 aspherical lens elements
- 3.5-27 f/Stop Range
- Focus 9.5" to Infinity
- 72mm filter diameter
- Weight 13.6 oz

Canon 17-55/2.8 EF-S USM Digital Lens

- *Exclusively designed for Digital SLRs*
- IS (Image Stabilizer) technology
- 2.8-22 f/Stop Range
- Focus 13.8" to Infinity
- Angle of View 78.3°-27.5°
- 77mm filter diameter
- Weight 22.4 oz

Canon 24-70/2.8 EF "L" USM Lens

- sealed and gasketed against dust & moisture
- Internal Focusing
- UD Element
- Two Aspherical Elements
- 2.8-22 f/Stop Range
- Focus 1.25' to Infinity
- 77mm filter diameter
- Weight 33.6 oz

Canon EOS Flash System (USA)

* Price After Rebate	Rebates Expire 7-11-09
220EX	95.00*
270EX	CALL
430EX II	$30 Rebate
580EX II	$50 Rebate
MR-14EX Ringlight	420.00*
MT-24EX Twin Flash	615.00*

EF-S Lenses For Digital Only (Compatible with the 20D, 30D, 40D, 50D & Digital Rebel only)	IMP	USA
60/2.8 USM Macro (52a)	$384.95	$370.00*
10-22/3.5-4.5 USM (77a)	$724.95	$699.95*
17-55/2.8 IS USM (67a)	$999.95	$960.00*
17-85/4-5.6 IS USM (67a)	$499.95	$465.00*
18-55/3.5-5.6 IS (58a)	$159.95	$155.00*
18-200/3.5-5.6 IS (72a)	CALL	CALL
55-250/4.0-5.6 IS USM (58a)	CALL	CALL

EF Lenses	IMP	USA
15/2.8	$639.95	$659.95
20/2.8 USM (72a)	$439.95	$449.95
24/2.8 (58a)	$299.95	$309.95
28/2.8 (52a)	$194.95	$199.95
28/1.8 USM (58a)	$439.95	$459.95
35/2 (52a)	$289.95	$299.95
50/1.8 (52a)	$99.95	$114.95
50/1.4 USM (58a)	$379.95	$399.95
50/2.5 Macro (52a)	$264.95	$274.95
MP-E 65/2.8 1x-5x Macro (58a)	$869.95	$899.95
85/1.8 USM (58a)	$369.95	$379.95
100/2.8 USM Macro (58a)	$509.95	$490.00*
100/2 USM (58a)	$404.95	$419.95
135/2.8 Soft Focus (57a)	$319.95	$324.95
400/4.0 DO IS (52a rear)	$5,349.95	$5,500.00
24-85/3.5-4.5 USM (67a)	$314.95	$322.00
28-105/3.5-4.5 II USM (58a)	$224.95	$209.00*
28-135/3.5-5.6 IS USM (72a)	$399.95	$409.95
28-200/3.5-5.6 USM (72a)	$359.95	$345.00*
70-300/4.5-5.6 DO IS USM (58a)	$1,169.95	$1,190.00
70-300/4-5.6 IS USM (58a)	$529.95	$549.00
75-300/4.0-5.6 III (58a)	$154.95	$159.95
75-300/4.0-5.6 III USM (58a)	$189.95	$200.00
100-300 4.5-5.6 USM (58a)	$284.95	$295.00

TS-E MF Lenses	IMP	USA
24/3.5 "L"	$1,129.95	$1,150.00
45/2.8	$1,179.95	$1,199.95
90/2.8	$1,179.95	$1,199.95

EF "L" Lenses	IMP	USA
14/2.8 USM II	$1,999.95	$2,020.00
24/1.4 II (77a)	CALL	CALL
35/1.4 USM (72a)	$1,234.95	$1,249.00
50/1.2 USM (72a)	$1,399.95	$1,349.95*
85/1.2 USM II (72a)	$1,859.95	$1,769.95*
135/2.0 USM II (72a)	$979.95	$999.95
180/3.5 USM Macro (72a)	$1,329.95	$1,349.95
200/2.0 IS USM (52a)	$3,099.00	$4,800.00*
200/2.8 USM (72a)	$734.95	$749.00
300/4.0 IS USM (77a)	$1,199.95	$1,229.95
300/2.8 IS USM (52a rear)	$3,999.95	$4,100.00
400/2.8 IS (52a rear)	$6,659.95	$6,800.00
400/5.6 USM (77a)	$1,189.95	$1,199.95
500/4 IS USM (52a rear)	$5,639.95	$5,800.00
600/4.0 IS (52a rear)	$7,399.95	$7,600.00
16-35/2.8 USM II (82a)	$1,479.95	$1,399.00*
17-40/4.0 USM (77a)	$734.95	$699.00*
24-70/2.8 USM (77a)	$1,249.95	$1,190.00*
24-105/4 IS USM (77a)	$1,079.95	$1,099.00
28-300/3.5-5.6 IS USM (77a)	$2,349.95	$2,399.00
70-200/4.0 USM (67a)	$599.95	$599.95*
70-200/4.0 IS USM (77a)	$1,069.95	$1,025.00*
70-200/2.8 USM (77a)	$1,229.95	$1,249.00
70-200/2.8 IS USM (77a)	$1,699.95	$1,599.00*
100-400/4.5-5.6 IS USM (77a)	$1,489.95	$1,400.00*
1.4x II Teleconverter	$299.95	$309.95
2x II Teleconverter	$299.95	$309.95

CANON INSTANT REBATES!

* Price After Rebate Rebates Expire 7-11-09	USA Price	Less Rebate	Final Cost
AF Flashes			
220 EX	$125.00	$30	$95.00
430 EX II	Call	$30	Call
580 EX II	Call	$50	Call
MR-14EX Ringlight	$470.00	$50	$420.00
MT-24EX Twin Flash	$685.00	$70	$615.00
EF-S Digital AF Lenses			
60/2.8 USM Macro	$400.00	$30	$370.00
10-22/3.5-4.5 USM	$749.00	$50	$699.00
17-55/2.8 IS USM	$1,030.00	$70	$960.00
17-85/4-5.6 IS USM	$515.00	$50	$465.00
18-55/3.5-5.6 IS	$170.00	$15	$155.00
AF Lenses			
100/2.8 USM Macro	$525.00	$35	$490.00
28-105/3.5-4.5 II USM	$229.95	$20	$209.95
28-200/3.5-5.6 USM	$375.00	$30	$345.00
AF "L" Lenses			
50/1.2 USM	$1,449.95	$100	$1,349.95
85/1.2 USM II	$1,899.95	$130	$1,769.95
200/2 IS USM	$5,300.00	$500	$4,800.00
16-35/2.8 USM II	$1,499.00	$100	$1,399.00
17-40/4.0 USM	$749.00	$50	$699.00
24-70/2.8 USM	$1,270.00	$80	$1,190.00
70-200/4.0 USM	$639.95	$40	$599.95
70-200/4.0 IS USM	$1,100.00	$75	$1,025.00
70-200/2.8 IS USM	$1,799.00	$200	$1,599.00
100-400/4.5 IS USM	$1,500.00	$100	$1,400.00

USA = Imported & Warrantied by Canon USA
IMP = Imported & Warrantied by B&H (not qualified for Canon USA Rebates & Warranties)

Nikon D40
"D-SLR" Digital SLR Camera

- Compact and Lightweight
- 6.1 MegaPixels
- 2.5" LCD Monitor
- SLR Viewfinder
- SD, SDHC (High Capacity) Card Slot
- Accepts Nikon AF Lenses (1.5x factor)
- Program, Digital Vari-Program, Aperture, Shutter, Manual, Exposure Compensation, Bracketing
- Auto or Manual Focus
- ISO 200-1600 • USB 2.0
- Nikon Inc. limited warranty included

6 MegaPixels

Kit with 18-55mm DX.....#NID401855

Nikon D90
"D-SLR" Digital SLR Camera

Quick Dial 64

- D-Movie mode record 720p HD movie clips
- 12.3 MegaPixels
- 3.0" LCD Monitor • SLR viewfinder
- Uses Nikon AF Lenses (1.5x factor)
- SD/SDHC (High Capacity) Card Slot
- In-Camera Image Editing
- Scene Recognition System
- Active D-Lighting • ISO 100-3200
- GPS geo-tagging • USB 2.0
- Self Cleaning Sensor • 4.5 fps Burst
- Nikon Inc. limited warranty included

12 MegaPixels

Body Only.....#NID90
Kit with 18-105mm VR.....#NID9018105

Nikon D5000
"D-SLR" Digital SLR Camera

- HD 720p Video Capture with Exposure Control
- 12.3 MegaPixels
- 2.7" Vari-angle LCD • Live View Mode
- Uses Nikon AF Lenses (1.5x factor)
- SD/SDHC Card Slot
- In-Camera Image Editing
- GPS Geotagging (optional)
- Personal Picture Control Settings
- 4 fps Burst Mode
- Nikon Inc. limited warranty included

12 MegaPixels

Body Only.....#NID5000
Kit with 18-55mm VR.....#NID50001855

Nikon D300
"D-SLR" Digital SLR Camera

- Self-Cleaning Sensor
- HDMI video out
- 12.3 MegaPixels
- 3" LCD Monitor • Live View Shooting
- Accepts Nikon AF Lenses (1.5x factor)
- CF, MD Card Slot • 6 fps Burst
- 51-Point AF System • USB 2.0
- Shutter Rated to 150,000 Cycles
- 200-3200 ISO (100-6400 with Boost)
- Nikon Inc. limited warranty included

12 MegaPixels

Body Only.....#NID300
Kit with 18-135mm DX.....#NID30018135
Kit w/18-200mm DX VR.....#NID30018200

Nikon D60
"D-SLR" Digital SLR Camera

- Integrated Dust Reduction System
- 10.2 MegaPixels
- 2.5" LCD Monitor • SLR Viewfinder
- Accepts Nikon AF Lenses (1.5x factor)
- SD/SDHC Card Slot
- 3 fps Burst • ISO 100-1600
- Stop-Motion Video • USB 2.0
- In-Camera Image Editing and RAW Processing
- Nikon Inc. limited warranty included

10 MegaPixels

Kit with 18-55mm VR.....#NID601855
Kit with 18-55 & 55-200mm Lenses.....#NID601855200

Nikon D700
"D-SLR" Digital SLR Camera

- Self Cleaning Sensor
- FX-format CMOS (full frame)
- 12.1 MegaPixels • Live View
- 3" VGA LCD Monitor • USB 2.0
- SLR viewfinder • 5 fps Burst
- 51-point AF System
- Uses Nikon AF Lenses
- CompactFlash Card Slot
- Dust and Water Resistant
- Active D-Lighting Mode
- HDMI Video Out • ISO 6400
- Nikon Inc. limited warranty included

12 MegaPixels

Body Only.....#NID700
Kit with 24-120mm VR.....#NID70024120

SLR Lenses & Flashes

Quick Dial 64

Nikon 10-24mm f/3.5-4.5 DX AF-S Wide Zoom AF Lens

- Exclusively designed for use with Digital SLRs
- Silent Wave Motor
- ED (Extra-low Dispersion)
- Super Integrated Coating
- 35mm equiv. 15-36mm
- Minimum focus 0.8'
- 77mm filter diameter
- Weight 16.2 oz

Nikon 24-70mm f/2.8 G AF-S ED-IF Wide Zoom AF Lens

- Optimized for edge-to-edge sharpness on both the Nikon FX (full-frame) & DX-format image sensors
- Rugged construction, dust and moisture resistance
- Minimum focus 1.2'
- 77mm filter diameter
- Weight 32 oz

Nikon 18-200mm f/3.5-5.6 DX G AF-S ED-IF Digital Lens

- Exclusively designed for use with Digital SLRs
- 35mm equiv. 27-300mm
- VR II Vibration Reduction
- SWM (Silent Wave Motor)
- 3.5-22 f/Stop Range
- Focus 1.6' to Infinity
- 72mm filter diameter
- Weight 19.8 oz

Nikon 50mm f/1.4 G AF-S Portrait AF Lens

- Optimized for edge-to-edge sharpness on both the Nikon FX (full-frame) & DX-format image sensors
- Silent Wave Motor
- Super Integrated Coating
- Minimum focus 1.5'
- 58mm filter diameter
- Weight 9.9 oz

Nikon

Nikon AF Flashes	IMP	USA
SB-400	CALL	CALL
SB-600	CALL	CALL
SB-900	CALL	CALL
R1 Wireless Twin Flash	CALL	CALL
R1C1 Wireless Twin Flash System	CALL	CALL
DX ED-IF Lenses for Digital Only	**IMP**	**USA**
10.5/2.8 Fish-Eye	$684.95	$699.95
35/1.8 G AF-S (52ø)	CALL	$199.95
10-24/3.5-4.5 G AF-S (77ø)	CALL	CALL
12-24/4 G AF-S (77ø)	CALL	CALL
16-85/3.5-5.6 G AF-S **VR** (67ø)	$599.95	$629.95
17-55/2.8 G AF-S (77ø)	CALL	CALL
18-55/3.5-5.6 G AF-S II (52ø)	$124.95	$129.95
18-55/3.5-5.6 G AF-S **VR** (52ø)	$174.95	$189.95
18-70/3.5-4.5 G AF-S (67ø)	CALL	CALL
18-105/3.5-5.6 G AF-S **VR** (67ø)	CALL	$359.95
18-135/3.5-5.6 G AF-S (67ø)	CALL	CALL
18-200/3.5-5.6 G AF-S (72ø)	$679.95	$699.95
55-200/4-5.6 G AF-S (67ø)	$174.95	$184.95
55-200/4-5.6 G AF-S **VR** (67ø)	$219.95	$229.95
Nikon D-Type AF Lenses	**IMP**	**USA**
14/2.8 D ED	$1,599.95	$1,719.95
16/2.8 D (39ø) with Hood	$869.95	$919.95
20/2.8 D (62ø)	$549.95	$569.95
24/2.8 D (52ø)	$349.95	$359.95
24/3.5 D ED **PC-E** (77ø)	$1,939.95	$1,999.95
28/2.8 D (52ø)	$254.95	$269.95
35/2.0 D (52ø)	$349.95	$359.95
45/2.8 D ED **PC-E** Micro (77ø)	$1,849.95	$1,899.95
50/1.8 D (52ø)	$129.95	$134.95
50/1.4 D (52ø)	$334.95	$344.95

Nikon D-Type AF Lenses	IMP	USA
50/1.4 G AF-S (58ø)	CALL	$484.95
60/2.8 D Micro (62ø) (1:1)	$459.95	$479.95
60/2.8 G AF-S ED Micro (62ø)	$529.95	$549.95
85/1.8 D (62ø) with Hood	$439.95	$449.95
85/1.4 D IF (77ø)	$1,139.95	$1,239.95
85/2.8 **PC-E** Micro (77ø)	$1,699.95	$1,799.95
105/2.8 G AF-S ED-IF **VR** Micro (62ø)	$874.95	$894.95
105/2.0 DC D with Hood (72ø)	$1,019.95	$1,099.95
135/2.0 DC D (72ø)	$1,249.95	$1,269.95
180/2.8 D ED-IF (72ø)	$879.95	$919.95
200/2 G AF-S ED-IF **VR** (52ø)	$4,749.95	$4,899.95
200/4 D ED-IF Micro w/Case (62ø)	$1,589.95	$1,629.95
300/4.0 D AF-S ED-IF (77ø)	$1,339.95	$1,369.95
300/2.8 G AF-S **VR** (52ø-R)	CALL	CALL
400/2.8 G AF-S **VR** ED (52ø)	CALL	CALL
500/4.0 G AF-S **VR** ED (52ø)	CALL	CALL
600/4.0 G AF-S **VR** ED (52ø)	CALL	CALL
14-24/2.8 G AF-S ED-IF	$1,769.95	$1,799.95
17-35/2.8 D (77ø)	$1,629.95	$1,769.95
24-70/2.8 G AF-S ED-IF (77ø)	$1,699.95	$1,729.95
24-85/2.8-4.0 D (72ø)	$669.95	$689.95
24-120/3.5-5.6 G AF-S **VR** (72ø)	CALL	CALL
70-200/2.8 G AF-S ED-IF **VR** (77ø)	$1,799.95	$1,899.95
70-300/4.5-5.6 G-AFS **VR** (67ø)	$524.95	$539.95
80-200/2.8 D with Collar (77ø)	$1,039.95	$1,099.95
80-400/4.5-5.6 D **VR** (77ø)	CALL	CALL
200-400/4 G AF-S ED-IF **VR** (52ø)	$5,849.95	$5,999.95
TC-14E II (1.4x) Teleconverter	CALL	CALL
TC-17E II (1.7x) Teleconverter	CALL	CALL
TC-20E II (2x) Teleconverter	CALL	CALL

USA = Imported & Warrantied by Nikon USA (AF lenses include 1 year warranty plus 4 years extended service coverage)
IMP = Imported & Warrantied by B&H (not qualified for Nikon USA Rebates & Warranties)

Nikon SB-600 Speedlight i-TTL Shoe Mount Flash

- Guide No. 98'
- Recycling Time 3.5 Seconds
- Bounce & Swivel Head
- Zoom Head (24-85mm)
- Multiple Flash Exposure Modes
- Safety lock on flash shoe
- Weight 10.6 oz

Nikon SB-900 Speedlight i-TTL Shoe Mount Flash

- Guide No. 131'
- Recycling Time 4.5 Seconds
- Bounce & Swivel Head
- Zoom Head (17-200mm)
- Stroboscopic Effect
- AF-Assist Illuminator
- Safety lock on flash shoe
- Weight 14.6 oz

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Ideal for tabletop and macro photography. Squeeze the Muse to focus, and bend your "sweet spot" around the photo.

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#LEMU* **$149.95**

SUNPAK PZ-42x II AF TTL Shoe Mount Flash

- Guide No. 138'
- AF Assist Light
- Automatic Shutdown Mode
- Large Illuminated LCD panel
- Bounce and Swivel Head
- Weight 9.1 oz

for Canon or Nikon

#SUPZ42X* **$149.95**

Vivitar 285HV Professional Auto Shoe Mount Flash

- Guide No. 120'
- Automatic exposure range to 70'
- 4 auto f/stop settings
- Removable sensor
- Bounce Head
- Zoom Head (28-105)
- Weight 14.9 oz

#VI285HV **$89.95**

Metz 58 AF-1 TTL Shoe Mount Digital Flash

- Guide No. 138'
- High-speed flash sync
- Bounce Head
- Swivel Head
- Zoom Head (28-105)

for Canon
#MES58AF1C **$399.95**
for Nikon
#MES58AF1N **$399.95**

Tokina 11-16mm f/2.8 Pro DX AT-X Fisheye AF Lens

- *Exclusively designed for Digital SLRs*
- WR (Water Repellent) coating
- Minimum Focus 1'
- Magnification ratio: 1:11.6
- Weight 1.2 lb

for Canon or Nikon

#TO1116.28PDX* **$599.95**

TAMRON 17-50mm f/2.8 XR LD-IF Di II Digital Lens

- *Exclusively designed for use with digital SLR cameras*
- Focus 10.6" to Infinity
- Mag. ratio of 1:4.5
- 67mm filter diameter
- Weight 15.2 oz

for Canon, Nikon or Sony/Minolta

#TO1750Z28* **$499.00**

SIGMA 18-50mm f/2.8 EX Macro DC Super Wide Angle Lens

- *Exclusively designed for use with digital SLRs*
- Minimum focus 7.9"
- Super Multi Layer (SML)
- 72mm filter diameter
- Weight 15.9 oz

for Canon, Nikon, Sigma, Olympus, Pentax, or Sony/Minolta

#SI1850EX* **$419.00**

SIGMA 18-200mm f/3.5-6.3 OS DC (Optical Stabilizer) Lens

- *Exclusively designed for use with digital SLR cameras*
- Focus 1.5' to Infinity
- Mag. ratio of 1:3.9
- 72mm filter diameter
- Weight 21.6 oz

for Canon, Nikon or Sigma

#SI18200OS* **$439.00**

SIGMA 70-200mm f/2.8 II EX APO Macro HSM DG

- *Desirable for Digital SLR Cameras*
- Minimum focus 3.3'
- 34-12.3° angle of view
- 77mm filter diameter
- Tripod collar - Wt. 48 oz

for Canon, Nikon, Sigma, Olympus, Pentax, or Sony/Minolta

#SI7220028* **$799.00**

SIGMA EM-140 DG TTL Ringlight

- Wireless TTL flash control
- High Speed Synchro flash
- Ideal for photographing subjects in fine detail - close-up photography

for Canon, Nikon, Sigma, Pentax, Sony/Minolta

#SIEM140DG* **$399.00**

Tokina

DX Models – Designed and optimized for digital SLR cameras only	SKU #	Canon EOS	Nikon AF
DX 35/2.8 Pro Macro (52ø)	#TO3528PDX*	$399.95	$399.95
DX 10-17/3.5-4.5 ATX Fisheye	#TO1017ZF*	$579.95	$579.95
DX 11-16/2.8 Pro (77ø)	#TO1116ZPDX*	$599.95	$599.95
DX 12-24/4.0 Pro (77ø)	#TO1224AF*	$399.95	$399.95
DX 12-24/4.0 Pro II (77ø)	#TO1224AFIX*	$499.95	$499.95
DX 16-50/2.8 Pro (77ø)	#TO1650ZDX*	$599.95	$599.95
DX 50-135/2.8 (67ø)	#TO50135Z8*	$29.95	$529.95

TAMRON

6-Year Warranty * Price After Rebate

Di – Designed for use on both digital & film SLR cameras
Di-II – Designed for Digital SLR cameras only

	Rebate	SKU#	Canon EOS	Nikon AF	Sony/ Minolta	Pentax AF
Di 90/2.8 Macro (55ø)	$60	#TA90281M*	$439.00*	$439.00*	$439.00*	$439.00*
Di 180/3.5 LD IF Macro (72ø)	$50	#TA18035*	$689.00*	$689.00*	$689.00*	—
Di-II 10-24/3.5-4.5 (ø)	—	#TA10243S*	$499.00	$499.00	—	—
Di-II 11-18/4.5-5.6 (77ø)	$75	#TA11185*	$494.00*	$494.00*	$494.00*	—
Di-II 17-50/2.8 XR LD IF Aspherical (67ø)	—	#TA17528*	$499.00	$499.00	$499.00	—
Di-II 18-200/3.5-6.3 (62ø)	$30	#TA18200S*	$269.00*	$269.00*	$269.00*	$269.00*
Di-II 18-250/3.5-6.3 (62ø)	—	#TA18250S*	$499.00	$499.00	$499.00	$499.00
Di-II 18-270/3.5-6.3 VC	—	#TA18270S*	$629.00	$629.00	—	—
Di 28-75/2.8 XR (67ø)	$10	#TA28758*	$489.00*	$489.00*	$489.00*	$489.00*
28-80/3.5-5.6 (58ø)	—	#TA28805*	$89.00	$89.00	$89.00	$89.00
Di 28-200/3.8-5.6 Asp XR IF Macro (62ø)	$50	#TA28200*	$249.00*	$249.00*	$249.00*	$249.00*
Di 28-300/3.5-6.3 XR (62ø)	$50	#TA28300ISD*	$369.00*	$369.00*	$369.00*	$369.00*
Di 28-300/3.5-6.3 XR VC (62ø)	—	#TA28300IS63*	$629.00	$629.00	—	—
Di-II 55-200/4-5.6 LD Macro (52ø)	$40	#TA55200456*	$159.00*	$159.00*	$159.00*	—
Di 70-200/2.8 LD IF Macro (77ø)	—	#TA70200Z28M*	$769.00	$769.00	$769.00	$769.00
75-300/4.0-5.6 LD (62ø)	—	#TA753004*	$164.00	$164.00	$164.00	$164.00
Di 200-500/5-6.3 LD IF (86Cø)	$30	#TA20050056*	$919.00*	$919.00*	$919.00*	—
SP 1.4x AF Pro Converter	—	#TA14XP*	$189.00	$189.00	—	—
SP 2x AF Pro Converter	—	#TA2XP*	$219.00	$219.00	—	—

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	SKU #	Canon EOS	Nikon AF	Sony/ Minolta	Olympus 4/3 Sys.	Pentax AF	Sigma AF
DC 4.5mm f/2.8 EX Circular Fisheye HSM *	#SI4528DCHSM*	$999.00	$999.00	$999.00	—	$999.00	$999.00
DG 8/3.5 EX Circular Fish-Eye *	#SI835*	$899.00	$899.00	$899.00	—	$899.00	$899.00
DC 10mm f/2.8 EX Fisheye HSM *	#SI1028EXHSM*	$699.00	$699.00	$699.00	—	$699.00	$699.00
DG 15/2.8 EX Diagonal Fish-Eye *	#SI1528DG*	$749.00	$749.00	$749.00	—	$749.00	$749.00
DG 20/1.8 EX DF RF Aspherical (82ø)	#SI2018*	$569.00	$569.00	$569.00	—	$569.00	$569.00
DG 24/1.8 EX DF Aspherical Macro (77ø)	#SI2418M*	$479.00	$479.00	$479.00	$479.00	$479.00	$479.00
DG 28/1.8 EX DF Aspherical Macro (77ø)	#SI2818M*	$379.00	$379.00	$379.00	—	$379.00	$379.00
DC 30mm f/1.4 EX HSM (62ø)	#SI3014DCS*	$439.00	$439.00	$439.00	$439.00	$439.00	$439.00
DG 50mm f/1.4 EX (77ø)	#SI5014*	$499.00*	$499.00*	$499.00	$499.00	$499.00	$499.00*
DG 50/2.8 EX Macro (55ø)	#SI5028MDG*	$299.00	$299.00	$299.00	—	$299.00	$299.00
DG 70/2.8 EX Macro (62ø)	#SI7028MDG*	$499.00	$499.00	$499.00	—	$499.00	$499.00
DG 105/2.8 EX Macro (58ø)	#SI10528MDG*	$479.00	$479.00	$479.00	$479.00	$479.00	$479.00
DG 150/2.8 EX APO Macro HSM (72ø)	#SI15028AMDG*	$729.00	$729.00	—	$729.00	—	$729.00
DG 300/2.8 APO EX HSM	#SI300288DG*	$3,299.00	$3,299.00	$3,299.00	—	$3,299.00	$3,299.00
DC 10-20/4-5.6 EX HSM (77ø)	#SI1020450*	$479.00	$479.00	$479.00	$479.00	$479.00	$479.00
DG 12-24/4.5-5.6 EX *	#SI122445*	$859.00*	$859.00*	$859.00	—	$859.00	$859.00*
DC 17-70/2.8-4.5 Macro (72ø)	#SI1770280C*	$369.00	$369.00	$369.00	—	$369.00	$369.00
DC 18-50/3.5-5.6 (58ø)	#SI185035*	$139.00	$139.00	$139.00	—	$139.00	$139.00
DC 18-50/2.8 EX Macro (72ø)	#SI185028*	$419.00	$419.00*	$419.00	$419.00	$419.00	$419.00
DC 18-125/3.8-5.6 OS (Optical Stabilizer) (67ø)	#SI18125350S*	$339.00*	$339.00*	$339.00	—	$339.00	$339.00*
DC 18-200/3.5-6.3 OS (Optical Stabilizer) (72ø)	#SI1820035*	$439.00	$439.00	—	—	—	$439.00
DC 18-200/3.5-6.3 IF Aspherical (62ø)	#SI1820035*	$319.00	$319.00	$319.00	—	$319.00	$319.00
DC 18-250/3.5-6.3 OS HSM (72ø)	#SI1825035*	$529.00	$529.00	$529.00	—	$529.00	$529.00
DG 24-70/2.8 EX Aspherical (82ø)	#SI2470281DG*	$569.00	$569.00	$569.00	—	$569.00	$569.00
DG 24-70/2.8 EX IF HSM (82ø)	#SI247028*	$899.00	$899.00	$899.00	—	$899.00	$899.00
DG 28-70/2.8-4.0 EX (58ø)	#SI287028D*	$159.00	$159.00	$159.00	—	—	$159.00
DG 28-70/2.8 EX (67ø)	#SI287028DG*	$379.00	$379.00	$379.00	—	$379.00	$379.00
DG 28-300/3.5-6.3 Macro (62ø)	#SI283003SDG*	$299.00	$299.00	$299.00	—	$299.00	$299.00
DC 50-150/2.8 EX HSM II (67ø)	#SI5015028*	$749.00*	$749.00	—	—	—	$749.00
DG 50-500/4-6.3 EX APO RF (86Cø)	#SI5050046*	$1,159.00*	$1,159.00*	$1,159.00	$1,159.00	$1,159.00	$1,159.00*
DC 55-200/4-5.6 (55ø)	#SI552004S*	$149.00	$149.00	$149.00	$149.00	$149.00	$149.00
DG 70-200/2.8 EX Macro II HSM (77ø)	#SI7020028*	$799.00	$799.00	$799.00	$799.00	$799.00	$799.00
DG 70-300/4-5.6 DL Macro Super II (58ø)	#SI7030045*	$159.00	$159.00	$159.00	—	$159.00	$159.00
DG 70-300/4-5.6 APO Macro Super II (58ø)	#SI7030045DG*	$209.00	$209.00	$209.00	—	$209.00	$209.00
DG 120-300/2.8 EX APO IF HSM (105ø)	#SI1203000G*	$3,199.00	$3,199.00	—	—	—	$3,199.00
DG 120-400/4.5-5.6 APO OS HSM (77ø Rear)	#SI124400*	$899.00	$899.00	$899.00	—	$899.00	$899.00
DG 150-500/5-6.3 APO OS HSM	#SI150550*	$999.00	$999.00	$999.00	—	$999.00	$999.00
DG 500-800/5.6 APO EX HSM	#SI5008000G*	$9,999.00	$9,999.00	—	$9,999.00	—	$9,999.00
DG 1.4x EX APO Tele-Converter	#SI1.4XDG*	$249.00	$249.00	$249.00	—	$249.00	$249.00
DG 2x EX APO Tele-Converter	#SI2XDG*	$299.00	$299.00	$299.00	—	$299.00	$299.00
DG EF-530 ST Flash	#EF530ST*	$169.00	$169.00	$169.00	—	$169.00	$169.00
DG EF-530 Super Flash	#EF530*	$239.00	$239.00	$239.00	—	$239.00	$239.00
DG EM-140 TTL Ringlight	#SIEM140DG*	$399.00	$399.00	$399.00	—	$399.00	$399.00

Bags & Cases

Quick Find 73

DPS 3N1 Sling/ Backpacks

3N1 bags provides fast equipment access and ultimate freedom, allowing three carrying options in one while morphing from sling to backpack and back again fast and easy.

	10 Small	20 Med.	30 Large
SKU #	#KA315BS	#KA315BM	#KA315BL
Color	Black		
HOLDS SLRs	1	1	1
Lens/Flash	2	4	6
Acc.	Yes	Yes	Yes
Price	$84.95	$99.95	$124.95

Lowepro Fastpack Backpacks

Protects your equipment and provide storage for accessories. Side-entry compartments let you quickly access gear & accessories, even while you're on the move.

	200	250	350
SKU #	#LOFP200*	#LOFP250*	#LOFP350*
Color	Black, Blue, Red		
HOLDS SLRs	1	1	1
Lens/Flash	3	4	4
Laptop	No	15.4"	17.4"
Price	$74.95	$89.95	$112.95

Manfrotto bogen 190X Series

Distributed by

Improved castings for reduced weight without compromising strength and stability. XB features low angle adapter, XPro8 features vertical/horizontal quick flip center column.

	190XDB	190XB	190XPRO8
SKU #	#8019KDB	#8019XB	#8019XPRO8
Head	Requires Head (head sold seperately)		
Load Capacity	11 lbs	11 lbs	11 lbs
Max. Height	57.5"	57.1"	57.5"
Leg Sections	3	3	3
Folded Length	23"	20.9"	22.4"
Weight	3.5 lbs	4 lbs	4 lbs
Price	$98.95	$129.95	$159.95

Manfrotto bogen 055X Series

Distributed by

Similar in design and features to the 190X series but with increased operating height and max load capacity. 055XB features low angle adapter, 055XPro8 features vertical horizontal quick flip center column.

	055XDB	055XB	055XPRO8
SKU #	#8055XDB	#8055XB	#8055XPRO8
Head	Requires Head (head sold seperately)		
Load Capacity	15.4 lbs	15.4 lbs	15.4 lbs
Max. Height	70"	70"	70.3"
Leg Sections	3	3	3
Folded Length	24"	24"	25.7"
Weight	4.6 lbs	5 lbs	5.3 lbs
Price	$139.95	$164.95	$179.95

TENBA Shootout Shoulder Bags

SHOOTOUT™ is designed from the ground up for serious outdoor imaging. Light on your shoulders but heavy on protection, access and features.

	Small	Medium	Large
SKU #	#TESS5*	#TESSM*	#TESSL*
Color	Black, Black/Olive, Silver/Black		
HOLDS SLRs	1	1	2
Lens/Flash	3	4	7
Acc.	No	No	Yes - 15"
Price	$90.95	$119.95	$159.95

tamrac Aero Backpacks

Speed Pack's Dual Entry System allows camera access via side door or front panel. Weatherproof exterior and foam padded interior compartments for a custom equipment fit.

	Speed Pack 75 #3375	Speed Pack 85 #3385
SKU #	#TA3375*	#TA3385*
Color	Black, Rust	
HOLDS SLRs	1	1
Lens/Flash	3	4
Laptop	No	17"
Price	$89.95	$119.95

BENRO Travel Angel

The Perfect Travel Companion Weight, capacity, folded length and maximum tripod height are the primary considerations for photographers who travel.

	A-169 MK	A-269 MK	C-169 MK
SKU #	#457-169	#457-269	#455-169
Head	BH-0	BH-1	No
Material	Alluminum	Alluminum	Carbon Fiber
Load Capacity	8.8 lbs	13.2 lbs	17.6 lbs
Max. Height	57.8"	60.3"	58.1"
Folded Length	14.1"	14.8"	14"
Weight	3.3 lbs	4 lbs	2.2 lbs
Price	$166.95	$185.95	$333.95

GITZO Explorer Series

Six Layer, pultrusion (spun), 100% carbon fiber tubes. "G Lock" leg locks. Legs and center column. Can be locked at a wide range of angles making it the perfect wilderness field tripod. Also available in Aluminum & Basalt.

	GT2130EX	GT2531EX	GT2541EX
SKU #	#GGT2130EX	#GGT2531EX	#GGT2541EX
Head	Requires Head (head sold seperately)		
Load Capacity	19.8 lbs	26.4 lbs	26.5 lbs
Max. Height	68.4"	66.9"	64.6"
Leg Sections	3	3	4
Folded Length	25.2"	25.2"	23.8"
Weight	5.2 lbs	4.1 lbs	4.1 lbs
Price	$374.95	$624.95	$674.95

Filters for Analog, Digital still or video cameras & lenses

SINGH-RAY Filters In Stock

Quick Find 73

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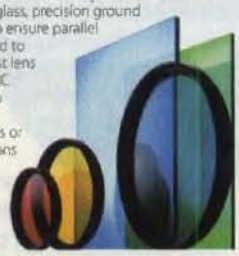

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	55	58	62	67	72	77
UV, KR1.5	25.95	25.95	29.95	38.95	44.95	51.95
UV, KR1.5 Multi-Coated	39.95	39.95	46.95	54.95	68.50	93.95
Circular Polarizer	66.95	68.95	72.95	86.50	99.50	111.95
Circular Polarizer Multi-Coated	99.50	99.50	104.95	124.50	143.50	169.95
81A, B, KR3, 6, 12, 15	25.95	25.95	29.95	38.95	44.95	51.95
KR1.5, 3, 6, 12, 15, 20	25.95	25.95	29.95	38.95	44.95	51.95
#021, 022, 023, 040, 041, 060, 061, 081, 090	25.95	25.95	29.95	38.95	44.95	51.95
Graduated (N.D. & Colors)	52.95	54.95	57.95	64.95	74.95	92.95
ND .9 (103), 1.8 (106), 3.0 (110), 4.0 (113), 6.0 (120)	44.95	44.95	69.95	69.95	89.50	99.95
Enhancing	43.95	45.95	72.95	74.95	94.95	104.95
Close-Up Lenses 0.25, 0.50, 1, 2, 3, 4, 5	25.95	25.95	29.95	38.95	44.95	51.95

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Schott Glass in Brass Rings	55	58	62	67	72	77
Skylight (1B), UV	32.75	34.25	45.00	51.25	63.00	73.75
Skylight (1B), UV SH-PMC	59.75	65.00	78.25	85.50	108.50	120.50
Circular Polarizer	85.50	89.75	96.75	112.00	134.00	153.00
Circular Polarizer SH-PMC	128.00	135.00	146.75	167.25	185.50	212.75
#5, #6, #25, #11, #13, #15, #22, 81A, 81B, 81C	32.75	34.25	45.00	51.25	63.00	73.75
Digital Filter	138.00	141.50	145.00	168.75	200.00	236.00

HOYA

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	58	62, 67	72	77	82
UV, Skylight (1B)	14.85	22.35	34.35	38.85	46.35
UV, Skylight (1B) HMC	22.35	32.85	40.35	49.35	62.85
UV, Skylight (1B) Super HMC	35.85	41.85	52.35	56.85	70.35
Circular Polarizer	40.35	58.35	70.35	82.35	109.35
Circular Polarizer HMC	76.35	92.85	130.35	169.35	262.35
Circular Polarizer Ultra-Thin Super HMC	83.85	101.85	149.85	187.35	281.85
"Moose" Warm Circular Polarizer	59.85	86.85	107.85	128.85	166.35
K2 Yel, K2 Yel/Grn, Grn X1, Or G, Red 25A	20.85	32.85	40.35	49.35	61.35
80A, B, C, 81A, B, C, 82A, B, C, 85, B, C	20.85	32.85	40.35	49.35	61.35
Close Up Set	49.35	68.85	88.35	97.35	—
Cross Screen, Diffuser	20.85	32.85	40.35	49.35	61.35
Fluorescent FLD, FLW	20.85	32.85	40.35	49.35	61.35
Intensifier – Blue, Green Field, Enhancement (Red)	40.35	62.85	70.35	83.35	—
Neutral Density 2x, 4x, 8x	20.85	32.85	40.35	49.35	61.35
Soft A, B	34.35	49.35	56.85	59.85	—

Film Color & B&W

Quick Find 71

COLOR PRINT FILM

	Kodak Gold – GA 100 IMP	Gold – GB 200 IMP	Max – GC 400 IMP	FUJIFILM Reala	Superia 200	Superia 400	Superia CZ 800	Press CZ 400
135-24	2.19	2.49	1.99	—	1.99	2.15	3.49	—
135-36	—	2.99	2.99	4.95	1.99	1.99	—	2.99

	Portra 160NC	Portra 160VC	Portra 400NC	Portra 400VC	800	Ektar 100	Pro 160C	Pro 160S	Pro 400H	800Z
135-36	4.69	4.69	5.79	5.99	6.50	4.50	5.75	4.89	5.75	5.99
120 Roll	3.49	3.99	4.30	4.30	5.09	3.79	3.79	3.50	3.75	4.39
220 PP (5)	41.45	—	42.95	42.95	—	—	7.50	7.50	7.99	7.99

PROCESSING MAILERS

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AGFA Processing

	35mm	120	220
Slide E6	9.49	9.49	18.95
Print C41	13.49	15.49	30.95

COLOR SLIDE FILM

	Kodak Kodachrome KR 64 USA	Ektachrome Professional E Series EPY 64 Tungsten	100 VS	100 G	100 GX	EPP 100	FUJIFILM Fujichrome Sensia RA 100	RM 200	RH 400	Velvia RVP Pro 50	100	Astia RAP 100F	Fujichrome Professional Provia RDP 100F	RXP III 400X	Tungsten RTP T64
135-36	8.50	11.49	6.99	7.50	7.50	12.95	4.89	6.49	8.99	6.89	6.25	5.80	5.75	8.95	8.29
120 Roll	—	6.95	5.25	5.59	5.29	6.79	—	—	—	4.50	4.59	3.99	3.89	5.99	4.79
220 PP (5)	—	—	11.95	—	—	—	—	—	—	9.99	8.99	8.39	8.39	—	—

COLOR SLIDE FILM

	Kodak Plus-X 125	Tri-X 400	TMX 100	TMY 400	TMZ 3200	BW 400 CN	ILFORD Pan F+ 50	FP4+ 125	HP5+ 400	Delta Pro 100	400	3200	XP2 Super 400	Infrared SFX 200	FUJIFILM Across 100	Neopan 400	1600	AGFA SLIDE Scala 200
135-36	5.49	3.95	5.50	4.19	7.50	4.29	5.19	5.09	3.89	5.45	5.35	6.15	5.49	8.95	3.95	3.75	3.95	12.95
120 Roll	—	3.95	3.95	3.29	—	4.49	3.85	3.69	3.45	3.39	3.79	4.25	3.59	7.95	2.95	2.95	—	—

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By Adam Crawford and Peter Kolonia

5 THINGS YOU DIDN'T KNOW ABOUT HOT-SHOE FLASH

SHOE-INS: Canon's top hot-shoe flash, the Speedlite 580EX II (A) provides flash exposure lock and bracketing, while Nikon's comparable Speedlight SB-900 (B) lets you customize its output patterns. Quantum Instrument's Qflash Trio (C) offers TTL control for Canon or Nikon.

1 TTL metering is overrated. DSLRs, with their exposure histograms and instant-feedback LCD screens, have diminished the importance of TTL (through-the-lens) flash metering. If you find a powerful, fully articulated, shoe-mount flash at a really good price, regardless of whether it's TTL-dedicated to your camera or not, consider buying it, if only as a backup unit. Using autoflash metering or simple manual flash, your camera's histogram and LCD preview can quickly lead you to perfect flash exposure, without TTL, often at a significantly lower price than a fully dedicated flash.

2 Batteries are a big deal. The type you select has a major impact on performance. Lithium AA cells offer light weight and huge capacity, but slow recycling. NiCds give you super-fast recycling, but far fewer pops per charge than NiMH cells, which have virtually replaced NiCds in the rechargeable category. Alkalines are cheap and available everywhere, but provide so-so capacity and recycle times.

3 Manually setting zoom-head focal length gives you special effects and other cool benefits. Autozoom heads are great for assuring adequate flash coverage for your subject, regardless of the focal length of the lens you're using. But have you ever noticed that you can also set you flash's zoom head manually? By dialing in a zoom setting that's longer than the focal length of your lens, you can create automatically vignetted corners for your images—something portrait photographers usually have to add in postproduction. Conversely, if you set a wider focal length on the flash head than you're shooting with, you help assure your picture is evenly lit edge-to-edge, with no falloff in the corners—perfect for group portraits.

4 Hot-shoe flashes aren't confined to hot-shoes. Many can be used off-camera and triggered by radio or infrared systems. (Canon's and Nikon's are highly advanced.) These often provide TTL exposure control, and usually include a transmitter built into the camera or placed in its hot-shoe, and a receiver attached to or built into the flash. Used off-camera, your hot-shoe flash can produce side-, back- or toplighting for far more creative effects than frontlighting alone can provide.

5 Shoe-mount flashes make experimenting easy. Don't be afraid to set your camera's manual-exposure mode—it's not hard to use and will let you customize exposure precisely. Using a shoe-mount flash in dim lighting lets you confidently experiment with your camera's manual-exposure mode, because TTL-controlled flash will automatically produce the correct light output for (almost) any shutter speed and aperture combination you set. This lets you play with depth of field, as well as relative foreground and background exposures—all the while confident that your subject will be correctly illuminated.

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15/2.8 EX DG Fisheye	740.00	740.00	740.00	740.00	740.00	—
20/1.8 EX-DG	560.00	560.00	560.00	560.00	560.00	—
24/1.8 EX-DG	470.00	470.00	470.00	470.00	470.00	—
28/1.8 EX-DG	370.00	370.00	370.00	370.00	370.00	—
30/1.4 EX-DC	430.00	430.00	430.00	430.00	430.00	430.00
50 1.4 EX DG HSM	480.00	480.00	480.00	480.00	480.00	480.00
50 2.8 EX DG Macro	290.00	290.00	290.00	290.00	290.00	—
70/2.8 EX DG Macro	480.00	480.00	480.00	480.00	480.00	—
105/2.8 EX-DG	470.00	470.00	470.00	470.00	470.00	470.00
150 2.8 EX DG Macro APO	—	720.00	720.00	—	720.00	720.00
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120-300 2.8 EX HSM DG	—	2100.00	2100.00	—	2100.00	—
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3 WAYS TO Take a Long Exposure

BY KATHLEEN DAVIS

Turn ordinary scenes into magical landscapes. Whether capturing silky waterfalls or the motion of the stars, you must use a tripod and remote shutter release—and avoid windy conditions. Here are three ways to get longer exposures by day or night.

1 **Turn down ISO.** Higher ISOs mean more noise, and you don't need the greater sensitivity since you'll be leaving the shutter open for a long time. Turn on your camera's noise-reduction setting (if it has one). Long-exposure night shots may still give you a lot of noise even with a low ISO, so you may still need noise-reduction software on the final image.

2 **Select a small aperture.** If you want to capture light trails (such as car tail lights), try setting your f-stop as high as f/22 to allow for very little light to strike your sensor while still getting a lot of detail in the motion.

3 **Use neutral-density filters.** A must-have tool for daytime long exposures, an ND filter cuts the light coming through the lens, so you can open your shutter longer even on bright days. Its light-blocking power is described in stops, usually between 3 and 9, so that an exposure you'd ordinarily set to 1/60 sec would be 1/4 sec using a 4-stop ND filter. For really long exposures, stack them up to 13 stops. High-quality ND filters are the most color-neutral, but some inexpensive *models can lend a muddy orange* cast to color images—if that happens, convert to black-and-white.

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EXPERT TIPS

BY THE BOOK

COMPILED BY KATHLEEN DAVIS

SHADOW OF A DOUBT

With light comes shadow, and there are several ways to avoid—or include—it in your photos. Here are a few:

- Shooting a landscape late in the day? With your back to the sun, chances are your shadow will end up in the frame. If you can't come back at another time of day, try moving and shooting at a different angle.
- When an object casts an unwanted shadow, wait for a cloud to cover the sun. Or zoom in over the shadow—best when there's a lot of foreground area.
- Try mixing shadows and sun. Some scenes benefit from dappled sunlight. (This might confuse your lightmeter, so be sure to bracket your shots.)
- Make a shadow your subject. It works well when you get an interesting shape on an uncluttered background. Look on a clear day just after dawn and before dusk, when shadows are long.

ADAPTED FROM *101 QUICK AND EASY SECRETS TO CREATE WINNING PHOTOGRAPHS* BY MATTHEW BAMBERG (COURSE TECHNOLOGY, 2009; $30)

MASTER STORYTELLER

Photojournalism-style wedding shots have become increasingly popular. Although most wedding photographers use flash, it can intrude on candids. Here are a few tips for getting beautiful photos with available light:

- Arrive early to get scene-setting images and learn your way around. You'll also be able to shoot the wedding party as they arrive with the dress. Set your white balance to Outdoor and use a low ISO for these shots, then switch when you move inside.
- If the wedding is in a church with a backlit altar, overexpose so that the couple doesn't end up in silhouette. If the church allows, shoot from the sides of the altar for individual shots with better lighting, as well as photos of the family sitting in the front row.

ADAPTED FROM *BETTER AVAILABLE LIGHT DIGITAL PHOTOGRAPHY* BY JOE FARACE AND BARRY STAVER (FOCAL PRESS, 2009; $30)

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FLASHPOINT	1220	252	2.8 Sec	5.25 lbs.	6v	$279.95
FLASHPOINT	1820	282	3 Sec	5.75 lbs.	6v	$329.95
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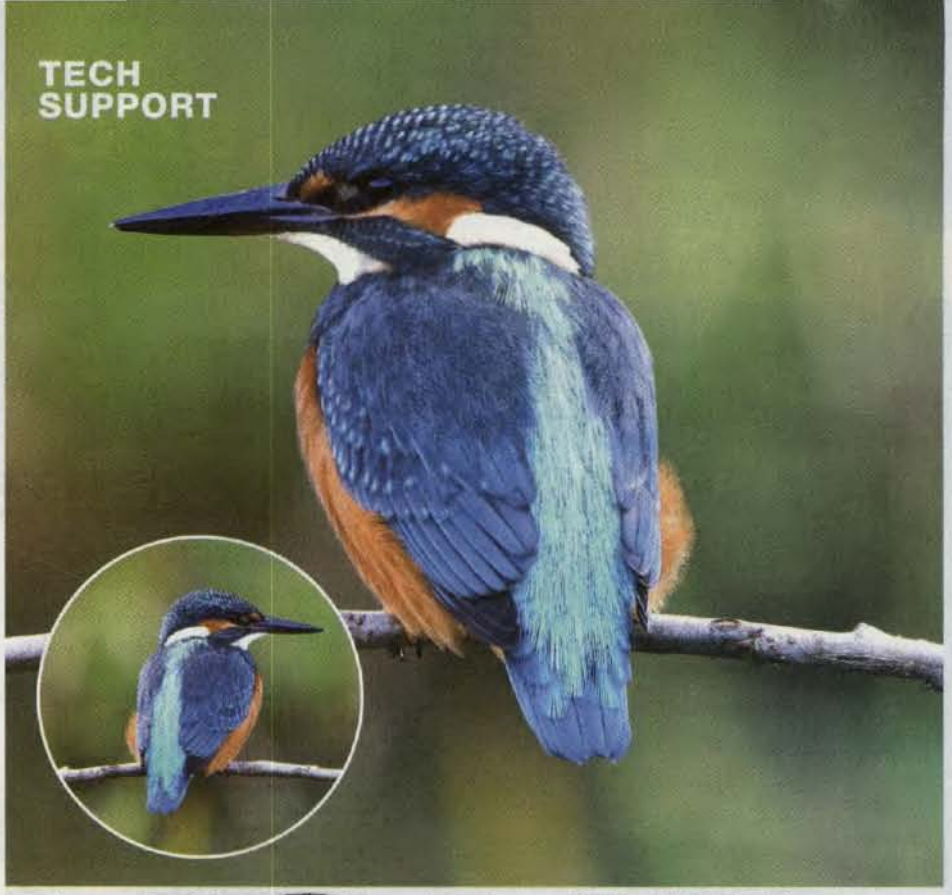

YOUR QUESTIONS ANSWERED

Flipping the bird

I'm putting together a montage of bird pictures, and the final product would be much better if I could reverse one of them, left to right. Why isn't image reversal a simple in-camera fix, and why can't I find it in my editing software?

George Munro
Brighton, CO

Camera makers probably don't put it in the camera because it's so easy to do in software. In Adobe Photoshop and Photoshop Elements 7, for example, it's the Flip Horizontal option in the Rotate menu. In Google's free Picasa program, it's even easier with the keyboard shortcut of Ctrl + Shift + H. You don't actually have to open the image, just select its thumbnail in the Picasa library.

Lens lag

I'm thinking of getting Canon's 70–200mm f/4L IS zoom for my Canon EOS 5D. I've read, though, that it focuses less rapidly

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in low light than the 70–200mm f/2.8 does. If this is true, would increasing the ISO result in faster autofocus? *Aaron Shepard*
Albany, NY

Sorry, no. Autofocus speed decreases with light levels as a function of the camera's AF system and the lens aperture, not ISO. The f/2.8 Canon lens may focus more briskly because the 5D (and other EOS DSLRs) has an additional central AF sensor that kicks in with f/2.8 and faster lenses. With twice the area sampled, the central AF target can lock more quickly onto a subject, especially one with vertical lines as this super sensor is deployed horizontally. That said, there are techniques for accelerating AF, such as shooting in the AI Servo AF mode, which will trigger the shutter without waiting for focus confirmation.

Stop loss

I recently bought a Nikon 60mm f/2.8G ED lens, and on my first use, I noticed that the f-stops increase from f/2.8 to f/4.8 while I was going from infinity to 1:1. I looked in the manual and they call it an exposure factor. Does this exposure factor apply for all macro lenses? *John Dill*
Allen, TX

Yes, all true macros. As you rack out a close-up lens to 1:1, its elements move significantly further from the imaging plane, and light transmission diminishes due to what's usually called the bellows factor. The effective aperture grows dimmer, hence your f/4.8 readout. Many camera systems, however, don't inform you of the effective aperture, but display the actual aperture, in your case, f/2.8. Why? Because although light transmission dims at 1:1, you still get the depth of field and other imaging characteristics (i.e. curvature of field, vignetting, chromatic distortion, etc.) associated with f/2.8, not f/4.8.

Hyper activity

I understand the concept of hyperfocal focusing and would like to use it in my landscape photography, but it's difficult with my lenses because they're either missing or have very narrow depth-of-field scales and distance markings. Are there any short focal length lenses for my Canon EOS 5D Mark II that have adequate DOF and distance markings?
Joe Zumar
Via e-mail

Wide-angle lenses, with their typically short-turning focusing collars and ample depths of field, rarely have or need depth-of-field scales. (Once you're to f/5.6, practically the entire focusing range is sharp, or nearly so.) It's only with tele focal lengths and their long-turning focusing rings that depth-of-field scales and hyperfocal distances come into play for placing zones of sharp focus.

Tele tally

I have two Nikon lenses (a 70–300mm f/4.5–5.6 VR and 18–200mm f/3.5–5.6 VR) but would like something longer for an upcoming trip to Alaska. Can I get by with Nikon's TC-20E II or TC-17E teleconverter, or should I spend more and get the 80–400mm or 200–400mm VR Nikkor? I shoot with Nikon's D200 and D70.
Lynn Smith
Via e-mail

A teleconverter's dimmer light transmission can stymie autofocus (especially at the longer focal lengths), and Nikon doesn't recommend converters for either of your VR lenses. The 80–400mm f/4.5–5.6 that you're considering ($1,550, street) was Nikon's first VR lens, and put up only average numbers in our test in the Pop Photo Lab (May 2001). Also, its VR will not work with your D200 body. So, if you can afford it, the 200–400mm f/4 ($5,900, street) is the better choice, although it's hard to find (usually backordered), heavy (7.2 pounds), and it, too, won't provide VR on your D200.

Our advice? Rent the 200–400mm f/4 and the TC-14E II teleconverter, which will get you out to 560mm, with full AF and VR—on the D70. ○

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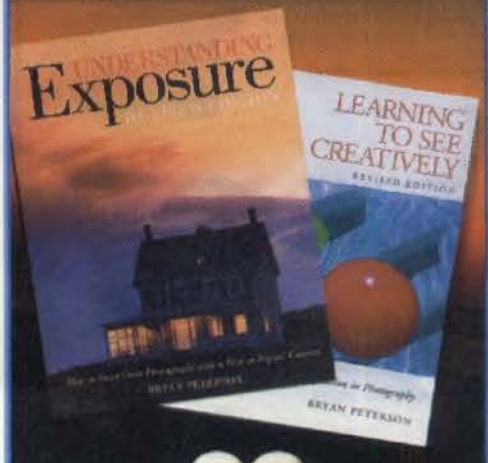

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ROBERT RAUSCHENBERG

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ALEX WEBB

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WILLIAM SAROYAN

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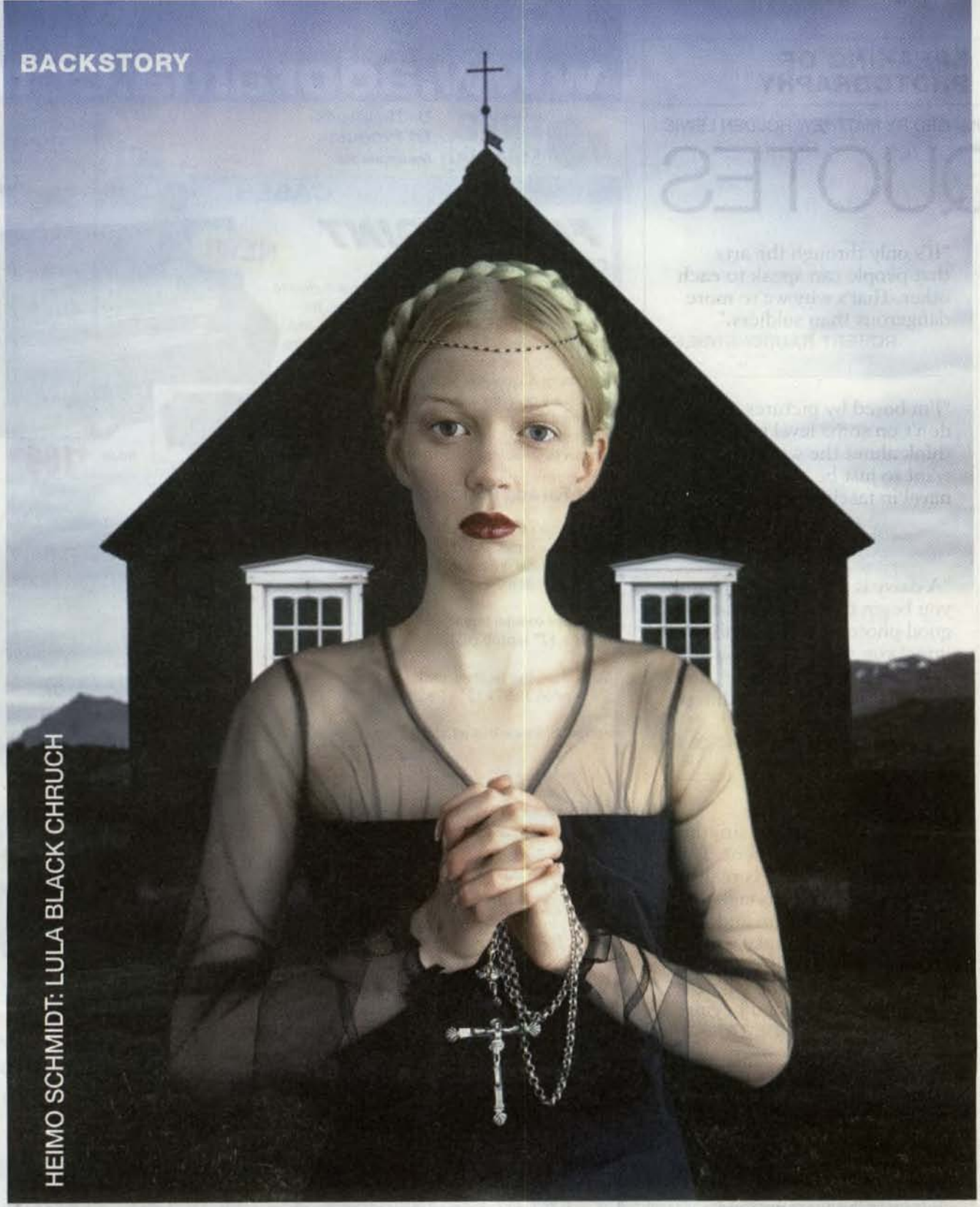

HEIMO SCHMIDT: LULA BLACK CHRUCH

HEIMO SCHMIDT, WWW.HEIMOPHOTOGRAPHY.COM

"This was in Snæfellsnes, Iceland. That area is so full of history: A little church has been there since 900 A.D. My wife and I were working together on an art series called *Myths*—a mythology cycle based on Icelandic sagas—and we shot a video there. Snæfellsnes is one of the places called the seven power points on the planet. I've always scoffed at that kind of stuff, but there's a really amazing energy. The girl was fantastic, just luminescent on film. This was pure daylight—it's 66 degrees north, so at the end of summer the sun just hits the water and bounces around. I shot this with an 8x10 camera that a friend custom-built for me out of parts from different view cameras. It's a lightweight version that I could put in my backpack with some film holders. A view camera forces you to compose: I had 10 film holders, and for this one I shot eight sheets of Kodak 160NC."

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Vincent Laforet high above New York City shooting with a Canon 5D Mark II and a 16GB Lexar Professional UDMA 300x CompactFlash card

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